



MOTOROLA

CES WIRELESS

DATA ON PASSPORT[®] CONFIGURATION GUIDE



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APPENDIX B: DATA AIRTIME USAGE ESTIMATOR

BASIC CES DATA CONFIGURATIONS

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Depending on the application, you can set up data in various ways on a PassPort system. The decision as to how best to configure data is driven by the following:

- Heavy volume of data—A heavy data user may wish to dedicate a talkgroup to data and not allow any voice traffic on that talkgroup.
- Light volume of data—A light data user may wish to have mostly voice traffic on a talkgroup with minimal data transmissions, thus supporting both voice and data on the **same** talkgroup.
- Volume of data, plus need for voice to be preferred over data—Some users may wish to mix "voice only" subscribers on the same talkgroup as "data and voice" subscribers. Remember that data shares bandwidth with voice. The more voice traffic you allow on a talkgroup, the less time is available for data broadcasts.

If you want to do "data and voice", your system configuration depends on whether you want to have "voice only" subscribers mixed in with "data and voice" subscribers. Additional consideration may be given to the amount of data you may wish to have voice only units receiving.

OVERVIEW

This section provides an overview of the considerations necessary to decide which of the four basic configurations are appropriate for your needs.

KEY CONSIDERATIONS

- Depending on the configuration, consider the following effects on squelch:
 - Mobiles connected to data terminals do **not** unsquelch when receiving data transmissions. The data terminal mutes the radio speaker when it detects data.
 - If you only have radios equipped with data terminals, you can send voice and data on the same talkgroup.
 - "Voice only" subscribers unsquelch when receiving data transmissions resulting in the reception of a loud data burst.
- Consider the fact that the data terminal does not know what talkgroup the radio is monitoring.
 - It is critical that subscriber radios used for data are set up on the same talkgroup. If the radio operator is allowed to switch the radio to different talkgroups, or allowed to switch to conventional channels, the data terminal has no way of knowing that it is not on its data talkgroup and will continue to attempt to key the radio and send data.
 - Data does not support features such as **Passport Group Scan** and **Hub Suspend Scan**. Data users must not be allowed to change talkgroups. Only the CES Data device is allowed to change talkgroups when in the data steering mode.
- When using data steering (Data on Primary - Voice and Data on secondary), both data talkgroups must have the same companding setting.
- The following software versions are required:
 - The CES TRK-240 must have software version 6.68 or later.
 - The CES MDC-150 must have version 4.13 or later.
 - The Motorola CDM1550-LS+ radio must have:
 - Firmware Version R05.05.02 or later
 - and Option board R07.01.11 or later



IMPORTANT

The radios running Enhanced Passport firmware are fully compatible with NTS 2.4, 2.6, and 2.8 versions. Also, it is compatible with NTS 4.0 using classic messages. In this case, it is said to operate in Classic Mode. While operating in the above conditions, the CES Data operation is similar to the R07.01.11 up to R07.02.09 versions.

When the radio runs the Enhanced PassPort firmware implementation and the new idle messages and Operation Critical features are enabled in the NTS 4.0 network, the following restrictions apply for CES Data operation:

- The Primary Group cannot be Emergency enabled in the NTS.
- The Secondary Group for data cannot be a Message Trunking and/or Emergency talk group.
- If the fleet has message trunking and/or emergency enabled talk groups, these specific groups must be unchecked in the radio scan list.
- MIN/Group registration must not be enabled in the NTS for data configured radios.

“DATA AND VOICE” AND “VOICE ONLY” SUBSCRIBERS REQUIRED ON THE SAME TALKGROUP

If you want to mix "data and voice" and "voice only" subscribers on your talkgroup, you can configure the system to send inbound data on a different talkgroup than voice, so the voice only radio users are not bothered by inbound data transmissions.

- Program the data mobile to switch to the primary talkgroup to send data (the data is sent on a different talkgroup).
- Program the "voice only" subscribers to ignore the primary talkgroup, so they do not unscquelch on data transmissions.

The use of the combination of primary and secondary talkgroups is necessary due to limitations imposed by the PassPort protocol. When a radio has roamed on to an affiliated site, it needs to register whenever it switches talkgroups, except in the case of switching between the primary and secondary talkgroup. When you are registered on a secondary talkgroup, the primary talkgroup is automatically registered. This configuration has the advantage of allowing "voice only" radios to operate on the same talkgroup with data equipped mobiles.



IMPORTANT

The price you pay for this flexibility is the loss of the use of the primary talkgroup as an “all call” because the primary talkgroup is now used for data.

“VOICE ONLY” SUBSCRIBERS NOT REQUIRED ON THE SAME TALKGROUP

If you do not need "voice only" radios on the same talkgroup, you may configure the system to do data and voice on the same talkgroup. The same system configuration can be used for data only on one talkgroup. The only significant difference is that you do not allow users to use voice on the talkgroup freeing up all the available airtime for data.

ADDITIONAL SECONDARY TALKGROUPS FOR NON-DATA

When using the Data on Primary – Voice/Data on Secondary configuration, you can use additional secondary talkgroups for non-data communication. That is, you can program non-data subscribers to ignore the primary talkgroup, so they can exist on additional secondary talkgroups under a primary talkgroup being used for data. But, be aware of the consequences:

- If one of these radios roams to another site, it will take the primary talkgroup with it. So all the data on the primary talkgroup will be repeated at the roam site, even though there may not be any data users roamed to that site.
- This could have significant impact on the resources available at the roam site.

BASIC CONFIGURATIONS

Data Only

- Dedicated data radio and data talkgroup, no voice communication allowed.
- Voice communication would be on a separate subscriber radio.
- This configuration is recommended when heavy data traffic is expected.
- Adequate antenna isolation between the data and voice radio is required for proper performance.

Data and Voice on the Same Talkgroup

- Voice and data share the bandwidth.
- All radios in the talkgroup are busied by all data transmissions (inbound and outbound).
- Limit voice communication if you have significant data traffic.
- Voice-Only users hear all data transmissions.
- Recommended for light data or voice usage.

Data on Primary, Voice/Data on Secondary with Two Radios

- Outbound data (message or acknowledgements) from the dispatch location on the voice channel (Secondary Talkgroup). Inbound data from the subscribers is automatically steered to the Primary Talkgroup.
- Voice-Only users hear outbound data bursts **only**.
- Field Subscribers would have the Primary Talkgroup **disabled**. Inbound data is heard **only** by the Dispatch mobile. Field mobiles would ignore other mobiles' data inbound transmissions and be able to communicate on the secondary talkgroup.

- This configuration distributes the data traffic between the two talkgroups in an effort to improve voice access to the system.
- It is preferred in systems that have long inbound data messages or many inbound data transmissions such as in a large AVL talkgroup.

Data on Primary, Voice/Data on Secondary with One Radio

- The Base side uses one radio for inbound and outbound data communication. The advantage of this configuration is cost reduction due to using less equipment.
- Outbound data (message or acknowledgements) from the dispatch location on the voice channel (Secondary Talkgroup). Inbound data from the subscribers is automatically steered to the Primary Talkgroup.
- Voice-Only users hear outbound data bursts **only**.
- Field Subscribers would have the Primary Talkgroup **disabled**. Inbound data is heard **only** by the Dispatch mobile. Field mobiles would ignore other mobiles' data inbound transmissions and be able to communicate on the secondary talkgroup.
- This configuration distributes the data traffic between the two talkgroups in an effort to improve voice access to the system.
- It is preferred in systems that have long inbound data messages or many inbound data transmissions such as in a large AVL talkgroup.

See Appendix A, “User Questionnaire,” and Appendix B, “Data Airtime Usage Estimator,” to help you determine the right configuration for your needs.



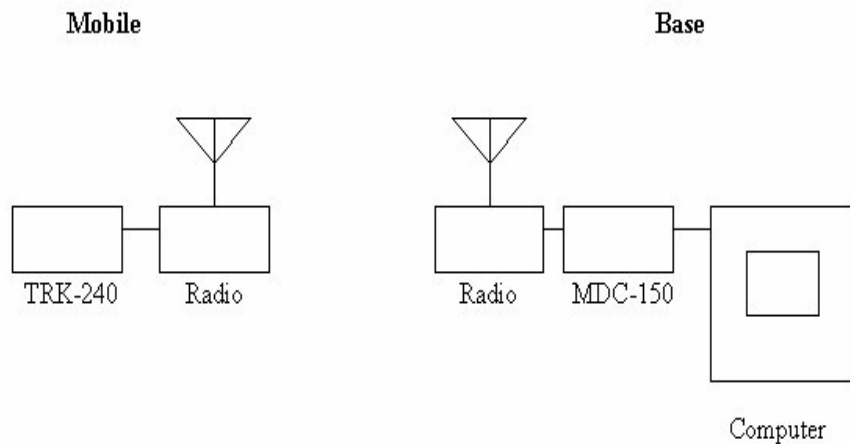
IMPORTANT

The output recommendation from the questionnaire and estimator are recommendations **only**. You should review and understand expected performance before choosing the appropriate configuration.

DATA ONLY CONFIGURATION

The subscriber radio is dedicated to data only. A dedicated data talkgroup is used. It is not used for voice communication traffic. The data calls are processed just like a typical PassPort voice call. Radios are not equipped with microphones. Figure 1-1 shows the configuration.

FIGURE 1-1 EQUIPMENT CONFIGURATION FOR DATA



NOTE

See "Configuration 1: Data Only" on page 2-2 for detailed configuration information.

INBOUND DATA

When the mobile data terminal needs to send a data message, it checks to see if the radio is available (Data Available). The mobile data terminal then waits for any talkgroup activity to end (Any TG detect), mutes the radio audio (RX Mute), asserts a PTT, and waits for confirmation that the call has been established, (Clear to Send (CTS)). Finally, it sends the data and dequeys the radio.

The MDC-150 modem sees that there is talkgroup activity (Any TG detect) and decodes the data message. The base end MDC-150 receives the data and if the checksum is correct, it sends an ACK back to the mobile.

The mobile receives the ACK.

OUTBOUND DATA

The MDC-150 waits for any talkgroup activity to end (Any TG detect) and then keys the radio (PTT) and waits for a channel assignment (CTS). It then sends the data to the mobiles.

The mobile receives the data and returns an ACK.

VOICE AND DATA ON THE SAME TALKGROUP

The Subscriber radio may be used for voice and data, so the configuration is the same as Data Only, except that the radios have microphones.

Data operation is the same as described in “Data Only Configuration” on page 1-6.

Voice traffic is allowed. The data terminal holds off sending data when voice activity is present. Voice and data share the bandwidth, so limit voice communication if you have significant data traffic.

Voice only subscribers on the same talkgroup hear voice and all data traffic. Voice only subscribers can be programmed to hold off unmuting to help eliminate the leading edge of the data bursts, but at the cost of truncating voice traffic.

See Figure 1-1 on page 1-6 for the equipment configuration. The Hardware configuration is identical to the data only scenario. However, the equipment is programmed differently.



NOTE

See “Configuration 2: Data and Voice on the Same Talkgroup” on page 2-13 for detailed configuration information.

DATA ON PRIMARY – VOICE/DATA ON SECONDARY WITH TWO RADIOS

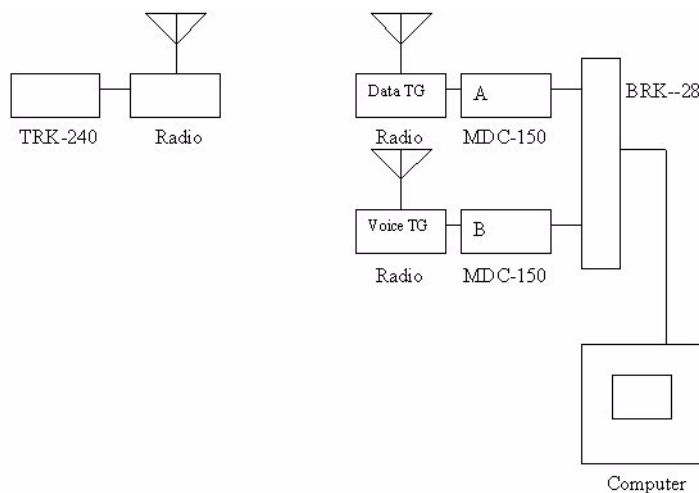
Data on Primary, Voice/Data on Secondary is the preferred configuration if you want voice traffic to have priority over data. The base is configured with two radios. One is dedicated to the primary talkgroup, and one is dedicated to the secondary talkgroup. Figure 1-2 shows the equipment configuration.

The base radio on the primary talkgroup is dedicated to receiving inbound data messages, and returning acknowledgements. The modem connected to this radio is programmed so that it rejects any outbound data traffic. The outbound data traffic is directed to the modem connected to the radio on the secondary talkgroup. This radio sends all outbound data messages and receives acknowledgements. The BRK-28 device multiplexes the serial data links between the base computer and the two data modems.

The mobile is programmed on the secondary talkgroup. It does not monitor the primary talkgroup. All voice and outbound data traffic occurs on the secondary talkgroup. When the data device needs to send inbound data, it switches the radio to the primary talkgroup, and holds it there until it receives the acknowledgement.

Voice only radios on the secondary talkgroup are programmed not to monitor the primary talkgroup so they do not unsquelch on inbound data traffic. They do hear outbound data bursts and voice.

FIGURE 1-2 EQUIPMENT CONFIGURATION FOR DATA ON PRIMARY – VOICE/DATA ON SECONDARY



**NOTE**

See “Configuration 3: Data on Primary – Voice/Data on Secondary (Two Radios)” on page 2-24 for detailed configuration information.

INBOUND DATA

When the mobile data terminal needs to send in a data message, it checks to see if the radio is available for data (Data Available). The mobile data terminal mutes the radio audio (RX-Mute), switches the radio to the primary talkgroup (data revert), keys the radio (PTT), and waits for a channel assignment (CTS). It then sends the data message (Flat Tx audio).

The data device holds the subscriber on the primary talkgroup waiting for an acknowledgement (ACK) from the base. The base end radio, on the primary talkgroup, receives the data and passes it to the MDC-150 modem. The modem checks the data parity and, if the message was received properly, it sends an ACK back to the subscriber, and forwards the data to the computer. When the ACK is received, the subscriber's modem reverts the radio back to the secondary talkgroup, and inactivates the audio mute. (If the ACK does not come back from the base, the “ACK wait time” timer expires and the subscriber restarts the entire process and re-sends the data.)

OUTBOUND DATA

The base computer sends a data message to the MDC-150 connected to the radio on the secondary talkgroup. The modem checks the radio to determine if there is data or voice activity on the data and voice talkgroups. When there is no activity, the modem keys the radio, waits for a clear to send, and then sends the data on the secondary talkgroup. The subscriber receives the data and passes it to the data modem. The modem detects the data and mutes the radio audio, so the user does not hear the data. If parity is correct, the modem sends an ACK back to the base on the secondary talkgroup.

DATA ON PRIMARY – VOICE/DATA ON SECONDARY WITH ONE RADIO

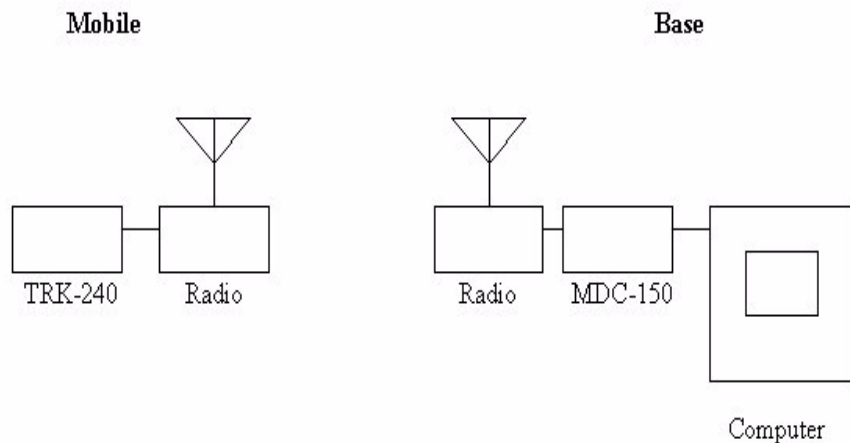
Data on Primary, Voice/Data on Secondary with one radio on the base side is the preferred configuration if you want voice traffic to have priority over data, and you have a lot of inbound data traffic with limited outbound traffic. Figure 1-3 shows the equipment configuration: Primary Talkgroup - Data Only (Inbound), Secondary Talkgroup - Voice/Data (Outbound).

The base radio is configured on the primary talkgroup to receive inbound data messages, and return acknowledgements. While the outbound data traffic is directed to the secondary talkgroup, the radio sends all outbound data messages and receives acknowledgements on the secondary talkgroup.

The mobile is programmed on the secondary talkgroup. It does not monitor the primary talkgroup. All voice and outbound data traffic occurs on the secondary talkgroup. When the data device needs to send inbound data, it switches the radio to the primary talkgroup, and holds it there until it receives the acknowledgement.

Voice only radios on the secondary talkgroup are programmed not to monitor the primary talkgroup so they do not unsquelch on inbound data traffic. They do hear outbound data bursts and voice.

FIGURE 1-3 EQUIPMENT CONFIGURATION FOR DATA ON PRIMARY – VOICE/DATA ON SECONDARY WITH ONE RADIO



NOTE

See "Configuration 4: Data on Primary, Voice/Data on Secondary (One Radio)" on page 2-45 for detailed configuration information.

INBOUND DATA

When the mobile data terminal needs to send in a data message, it checks to see if the radio is available for data (Data Available). The mobile data terminal mutes the radio audio (RX-Mute), switches the radio to the primary talkgroup (data revert), keys the radio (PTT), and waits for a channel assignment (CTS). It then sends the data message (Flat Tx audio).

The data device holds the subscriber on the primary talkgroup waiting for an acknowledgement (ACK) from the base. The base end radio, on the primary talkgroup, receives the data and passes it to the MDC-150 modem. The modem checks the data parity and, if the message was received properly, it sends an ACK back to the subscriber, and forwards the data to the computer. When the ACK is received, the subscriber's modem reverts the radio back to the secondary talkgroup, and inactivates the audio mute. (If the ACK does not come back from the base, the "ACK wait time" timer expires and the subscriber restarts the entire process and re-sends the data.)

OUTBOUND DATA

The base computer sends a data message to the MDC-150 connected to the radio (radio must be on the secondary talkgroup). The modem checks the radio to determine if there is data or voice activity on the data and voice talkgroups. When there is no activity, the modem keys the radio, waits for a clear to send, and then sends the data on the secondary talkgroup. The subscriber receives the data and passes it to the data modem. The modem detects the data and mutes the radio audio, so the user does not hear the data. If parity is correct, the modem sends an ACK back to the base on the secondary talkgroup.

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CONFIGURING DATA

This section explains how to set up data for the different configurations. This chapter has the following topics:

- “Configuration 1: Data Only” on page 2-2
- “Configuration 2: Data and Voice on the Same Talkgroup” on page 2-13
- “Configuration 3: Data on Primary – Voice/Data on Secondary (Two Radios)” on page 2-24
- “Configuration 4: Data on Primary, Voice/Data on Secondary (One Radio)” on page 2-45
- “PIN Definitions” on page 2-62



IMPORTANT

Screenshots assist you with setting up data parameters. Be aware that on non data-related fields, your system settings may be different. Tampering with these settings could result in impaired performance.

ACCESSING THE MDC-150

These steps explain how to get started with the MDC-150 Programming software from CES Wireless Technologies. These steps are the same for all configurations.

1. Select **File**, and then select **Start/Stop Pooling** to start communication with MDC-150.
2. Select **File**, and then select **CES Only Mode** to enable Programming. In CES Mode – Enter Password window, enter the CES Mode password and click **OK**.
3. Select **MDC**, and then select **Request unit Program**.
4. In the popup window, enter the MDC unit address and click **OK**.
5. On the Unit Parameters window, click **Done**.
6. Select **MDC**, and then select **Program unit**.
7. In the popup window, enter the MDC unit address and click **OK**.

CONFIGURATION 1: DATA ONLY

This section explains how to configure Data Only for the following:

- MDC-150 data modem
- Base and mobile radios
- TRK-240 mobile data terminal

CONFIGURING THE MDC-150 – DATA ONLY

Using MDC-150 Programming software from CES Wireless Technologies, configure the MDC-150 data modem located at the fixed Base location. Do the following:

1. Select **MDC**, and then select **Program unit**.
2. Select the settings on the Edit Unit Parameters dialog box as shown in Figure 2-1:

FIGURE 2-1 EDIT UNIT PARAMETERS DIALOG BOX

Edit Unit Parameters

Section	Parameter	Value
Radio Parameters	MDC Address	a
	System ID	0
	Radio Type	LTR
	Lead In Delay	50 x10ms
	Busy/Request	10 ms
	Request Window	350 x10ms
	Grant Check	2 x10ms
	Grant Window	400 x10ms
	Baud Rate	1200
	Min TX Time	10 x10ms
Acknowledgement	Wait Time	500 x10ms
	Response	10 x10ms
Retry	Time Window	900 x10ms
	Number	3
Polarity	Spkr Enable	Active Lo
	Spkr Mute	Active Lo
	Mic Mute	Active Lo
	Busy	Active Lo
	PTT In	Active Lo
	PTT Out	Active Lo
Encryption	Key 1	0
	Key 2	0
	Key 3	0
Channel Change Before Data is Sent	Count	1
	Timer 1	0 x10ms
Channel Change After Data is Sent	Count	1
	Timer 1	0 x10ms
Busy	Ignore Busy For Acks	<input type="checkbox"/>
	Ignore Busy For PTT	<input checked="" type="checkbox"/>
Frame Transmit Function	Holdoff Time	100 x10ms
	Frame Transmit Function	Before & After Channel Change
Channel Change After Data is Sent	Change	When frame is sent
	Type	Off
Channel Change Before Data is Sent	Change	Before channel is acc
	Type	Off
Channel Change After Data is Sent	Release PTT after Channel Change for Acks	<input type="checkbox"/>
	Enable Strip Turnoff on Aux Out 1	<input type="checkbox"/>

Buttons: Send, Cancel

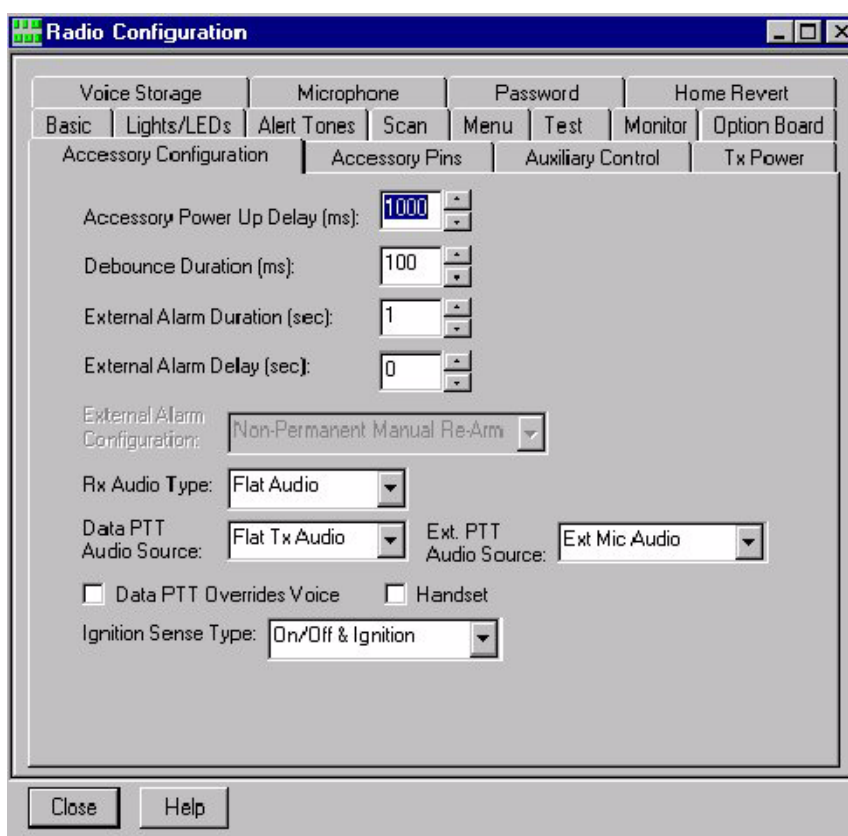
CONFIGURING THE BASE AND MOBILE RADIOS IN CPS – DATA ONLY

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-2). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-2 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-3), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-3 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Radio Configuration

Voice Storage | Microphone | Password | Home Revert

Basic | Lights/LEDs | Alert Tones | Scan | Menu | Test | Monitor | Option Board

Accessory Configuration | **Accessory Pins** | Auxiliary Control | Tx Power

Accessory Package: Default

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

Close Help

CONFIGURING THE BASE AND MOBILE RADIOS IN PPCPS – DATA ONLY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

DISABLING THE PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-4).

- Under Primary Talkgroup, select the **Disable Priority** check box to allow the data only radio to only monitor the data talkgroup.

FIGURE 2-4 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window has a title bar with standard Windows controls. Below the title bar are five tabs: 'System Info' (active), 'Channel Data', 'System Timers', 'Timeout Timers', and 'RSSI'. The 'System Info' tab contains two main sections: 'Identification' and 'Features'. The 'Identification' section has five text input fields: 'Zone Alias' (containing 'CORPORATE'), 'Mobile Identity Number (MIN)' (containing '157'), 'Primary Group ID' (containing '60000'), 'Home System ID (HSID)' (containing '849'), and 'Affiliated System ID (ASID)' (containing '40'). Below these fields is an 'Edit Talk Groups' button. The 'Features' section has a list of checkboxes: 'Invert Rx Data', 'Invert Tx Data', 'Disable Roam', 'Disable ATB Ring Back', 'Enable PP Group Scan' (checked), and 'Interconnect Companding' (checked). Below the 'Features' section is a 'Primary Talkgroup' section with two checkboxes: 'Disable Priority' (checked) and 'Disable Transmit' (unchecked). At the bottom of the window, there is a status bar showing '1 of 5' and a set of navigation buttons (left arrow, right arrow, double left arrow, double right arrow, and a green plus/red minus button). Below the navigation buttons are 'Done' and 'Cancel' buttons.

MUTING ALL ACTIVITY ON THE DATA TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-5).

- For the Data Talkgroup, select the **Rx Mute for Data** check box. This selection mutes all activity on this talkgroup.

FIGURE 2-5 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPand	Horn and Lights	Rx Mute for Data
Primary	1	60000	Primary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	2	59999	Data Talkgroup	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	3	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	4	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	5	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	6	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	7	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	8	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	9	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	10	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	11	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	12	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	13	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	14	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	15	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	16	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

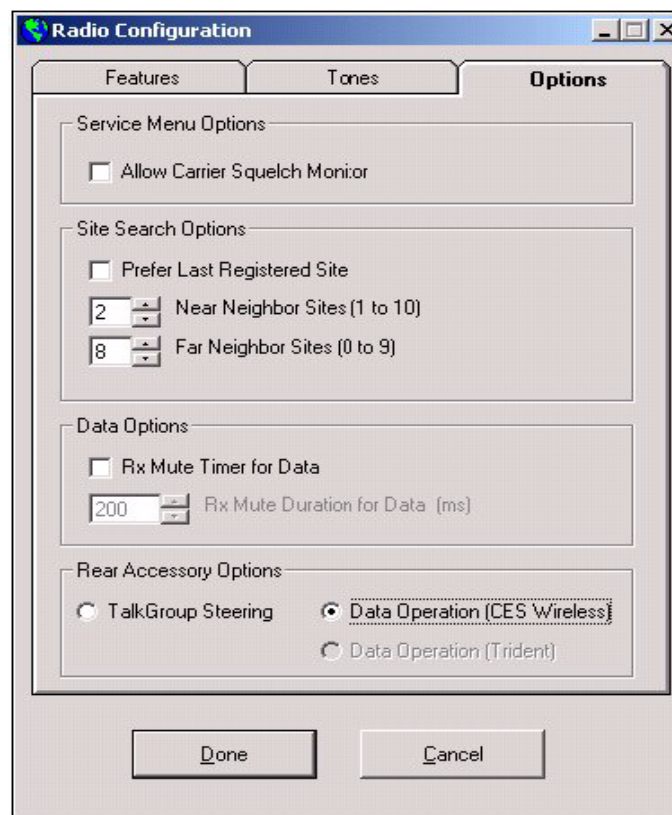
Done Cancel

MUTING ALL ACTIVITY ON THE DATA TALKGROUP – PART 2

Choose the following setting on the **Options** tab of the Radio Configuration dialog box (Figure 2-6).

- Clear the **Rx Mute Timer for Data** check box on the data talkgroup, so all activity on the data talkgroup is muted.

FIGURE 2-6 PPCPS RADIO CONFIGURATION OPTIONS TAB



CONFIGURING THE TRK-240 – DATA ONLY

Use the TRK-240 Programming Software from CES Wireless Technologies to select the settings for data on the TRK-240 mobile data terminal.

SETTING UP THE RADIO TAB

On the **Radio** tab, set the following key areas as shown in Figure 2-7 on page 2-9.

- In the Radio Interface area:
 - **Baud Rate** list: select **1200**.
 - **Radio Type** list: select **LTR** for PassPort radios.
 - **Lead in Delay**: type the time as shown from clear-to-send to start of data.
- In the Busy area:
 - **Frame Transmit Function** list: select **Before and After Channel Change**.
 - **Holdoff Time** box: type the time as shown, which means that the radio waits this long after a busy clears before keying.
 - **Busy must be active to receive frames** check box: select this to only decode data when the talkgroup is active.
- In the Frame Transmit area:
 - **Ack Wait Time** box: type the time as shown, which means that the radio waits this long for the Acknowledgement before resending data message.
 - **Retry Window**: type the time as shown, which means that the radio waits a random time before resending data but sends data within this window.
 - **Repeat Count** box: type the time as shown, which is the number of attempts to send data message.
 - **Ack Response Time** box: type the time as shown, which is the amount of time to wait after receiving a message and sending an ACK.



NOTE

Changing other parameters may result in impaired system performance.

FIGURE 2-7 RADIO TAB

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I / O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Unit ID

System ID: 0 Unit ID: 2

Radio Interface

Baud Rate: 1200

Radio Type: LTR

Lead In Delay: 50 x 10ms

Request Check: 10 x 1ms

Request Window: 350 x 10ms

Grant Check: 2 x 10ms

Grant Window: 400 x 10ms

Encryption

Encrypt 1: 0 Encrypt 2: 0 Encrypt 3: 0

Group ID's

Group 1: 0 Group 6: 0

Group 2: 0 Group 7: 0

Group 3: 0 Group 8: 0

Group 4: 0 Group 9: 0

Group 5: 0 Group 10: 0

Busy

☐ Ignore When Sending Acks

☒ Ignore When PTT In Is Active

Frame Transmit Function: Before and After Channel Change

Holdoff Time: 300 x 10ms

☒ Busy must be active to receive frames

Frame Transmit

Ack Wait Time: 500 x 10ms Retry Window: 500 x 10ms

Repeat Count: 4 Ack Response Time: 10 x 10ms

CONFIGURING THE CHANNEL CHANGE SETTINGS

Select the following settings on the **Channel Change** tab (Figure 2-8):

- Select **Off** on the **Channel Change Before Data is Sent** list and the **Channel Change After Data is Sent** list.



NOTE

You do not want the radio to revert to the primary talkgroup to send data, so you must turn off Channel Change before and after data is sent.

FIGURE 2-8 CHANNEL CHANGE TAB

The screenshot shows the 'Channel Change' tab in the TRK-240s configuration software. The window has a menu bar (File, Device, Configure, Program, Diagnostics, Help) and a toolbar with tabs for Radio, Channel Change, I/O, Serial, GPS, ANI / Status, and various keys. The 'Channel Change' tab is active, showing two main sections: 'Channel Change - Before Data Is Sent' and 'Channel Change - After Data Is Sent'. Both sections have a dropdown menu set to 'Off'. Below each dropdown are three input fields: 'Timer 1' (0 x10ms), 'Timer 2' (120 x10ms), and 'Count' (1). The 'Change' dropdown for 'Before Data Is Sent' is set to 'Before channel is accessed', and for 'After Data Is Sent' it is set to 'After ack is received'. To the right, there are checkboxes for 'Decrement retries on channel access error' (checked), 'Enable strip turnoff code on Aux Out 1' (unchecked), and a 'Registration input' dropdown set to 'Aux in 1: active low'. At the bottom, there is an 'Acknowledgments' section with a checkbox for 'Perform channel change' (unchecked).

SETTING UP THE I/O TAB

On the **I/O** tab, set the **Speaker Mute** area as shown in Figure 2-9. This mutes the speaker while waiting for the ACK, and when transmitting. The rest of the screen is user specific, and not related to PassPort operation.

FIGURE 2-9 I/O TAB

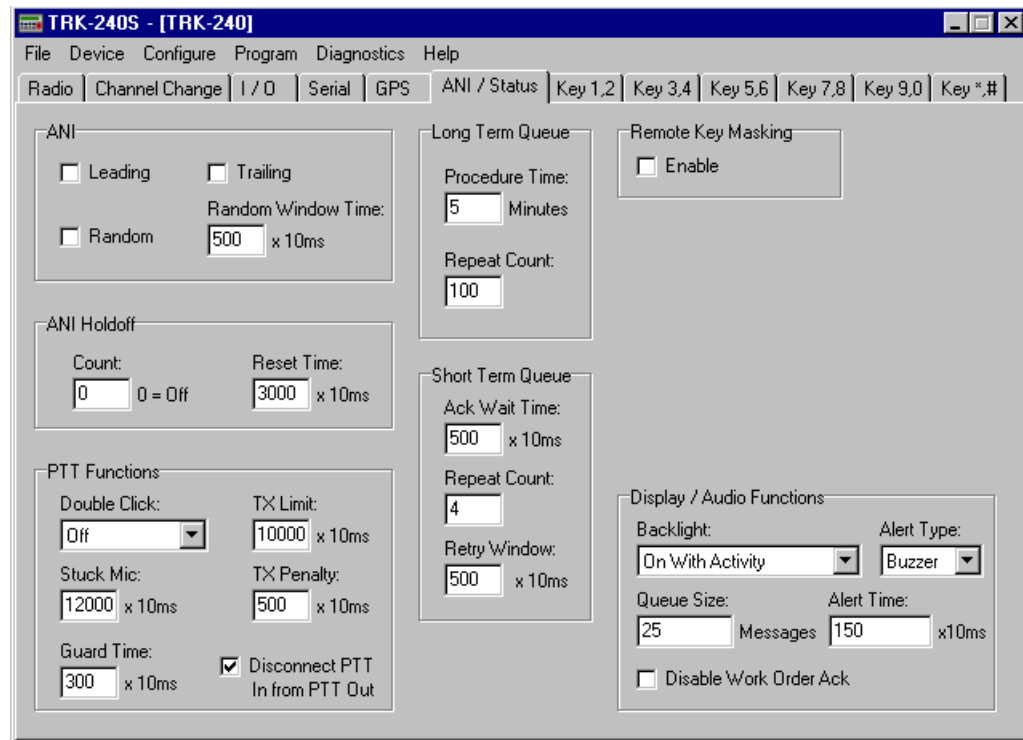
The screenshot shows the configuration window for the TRK-240S radio, specifically the I/O tab. The window has a menu bar with File, Device, Configure, Program, Diagnostics, and Help. Below the menu bar is a tabbed interface with Radio, Channel Change, I/O (selected), Serial, GPS, ANI / Status, Key 1,2, Key 3,4, Key 5,6, Key 7,8, Key 9,0, and Key *,#. The I/O tab contains several sections:

- Auxiliary Inputs:** Four dropdown menus for Aux In 1, Aux In 2, Aux In 3, and Aux In 4 (Ignition), all set to "Off".
- Power Up States:** Four dropdown menus for Aux In 1, Aux In 2, Aux In 3, and Aux In 4 (Ignition), all set to "Ignore".
- Talk Mode:** Alert Time: 1000 x 10ms, Mode: Open, Reset Time: 1000 x 10ms, Initial State: Open.
- Horn:** Enable checkbox is unchecked. On Count: 3, On Time: 100 x 10ms, Off Time: 100 x 10ms.
- Speaker Mute:** Active During: checked, Ack Wait Time: checked, Frame Transmit: checked. Enable Constant Seaker Mute checkbox is unchecked. Auto-mute Duration: 20 x 10ms.
- Output Polarity:** Three dropdown menus for Aux Out 1, Aux Out 2, and Aux Out 3, all set to "Active lo (invert)".
- Mic Mute:** Active lo dropdown menu.
- Speaker Mute:** Active lo dropdown menu.
- PTT:** Active lo dropdown menu.
- Horn Honk:** Active lo dropdown menu.
- Speaker Enable:** Active lo dropdown menu.
- Aux Out R:** Active lo dropdown menu.
- Input Polarity:** Trunk: Active lo, Ignition: Active lo, PTT: Active lo, Busy: Active lo.
- Emergency:** Input: Off, Supervisory: Off.

SETTING UP THE ANI/STATUS TAB

On the **ANI/Status** tab, set the **PTT Functions**, **Long Term Queue**, and **Short Term Queue** areas as shown in Figure 2-10.

FIGURE 2-10 ANI/STATUS TAB



CONFIGURATION 2: DATA AND VOICE ON THE SAME TALKGROUP

This section explains how to configure Data and Voice on the same Talkgroup for the following:

- MDC-150 data modem
- Base and mobile radios
- TRK-240 mobile data terminal

CONFIGURING THE MDC-150 – DATA AND VOICE ON THE SAME TALKGROUP

Using MDC-150 Programming software from CES Wireless Technologies, configure the MDC-150 data modem located at the fixed Base location. Do the following:

1. Select **MDC**, and then select **Program unit**.
2. Select the settings on the Edit Unit Parameters dialog box as shown in Figure 2-11:

FIGURE 2-11 EDIT UNIT PARAMETERS

Edit Unit Parameters

Section	Parameter	Value
Radio Parameters	MDC Address	a
	System ID	0
	Radio Type	LTR
	Lead In Delay	50 x10ms
	Busy/Request	10 ms
	Request Window	350 x10ms
	Grant Check	2 x10ms
	Grant Window	400 x10ms
	Baud Rate	1200
	Min TX Time	10 x10ms
Acknowledgement	Wait Time	500 x10ms
	Response	10 x10ms
	Perform Channel Change	<input type="checkbox"/>
Retry	Time Window	900 x10ms
	Number	3
Polarity	Spkr Enable	Active Lo
	Spkr Mute	Active Lo
	Mic Mute	Active Lo
	Busy	Active Lo
	PTT In	Active Lo
	PTT Out	Active Lo
Encryption	Key 1	0
	Key 2	0
	Key 3	0
Channel Change Before Data is Sent	Count	1
	Change	Before channel is acce
Channel Change After Data is Sent	Count	1
	Change	When frame is sent
Busy	Ignore Busy For Acks	<input type="checkbox"/>
	Ignore Busy For PTT	<input checked="" type="checkbox"/>
Channel Change After Data is Sent	Timer 1	0 x10ms
	Timer 2	0 x10ms
Channel Change After Data is Sent	Type	Off
	Release PTT after Channel Change for Acks	<input type="checkbox"/>
Channel Change After Data is Sent	Enable Strip Turnoff on Aux Out 1	<input type="checkbox"/>
	Frame Transmit Function	Before & After Channel Change
Channel Change After Data is Sent	Busy Must Be Active To Recieve	<input checked="" type="checkbox"/>
	Send	Cancel

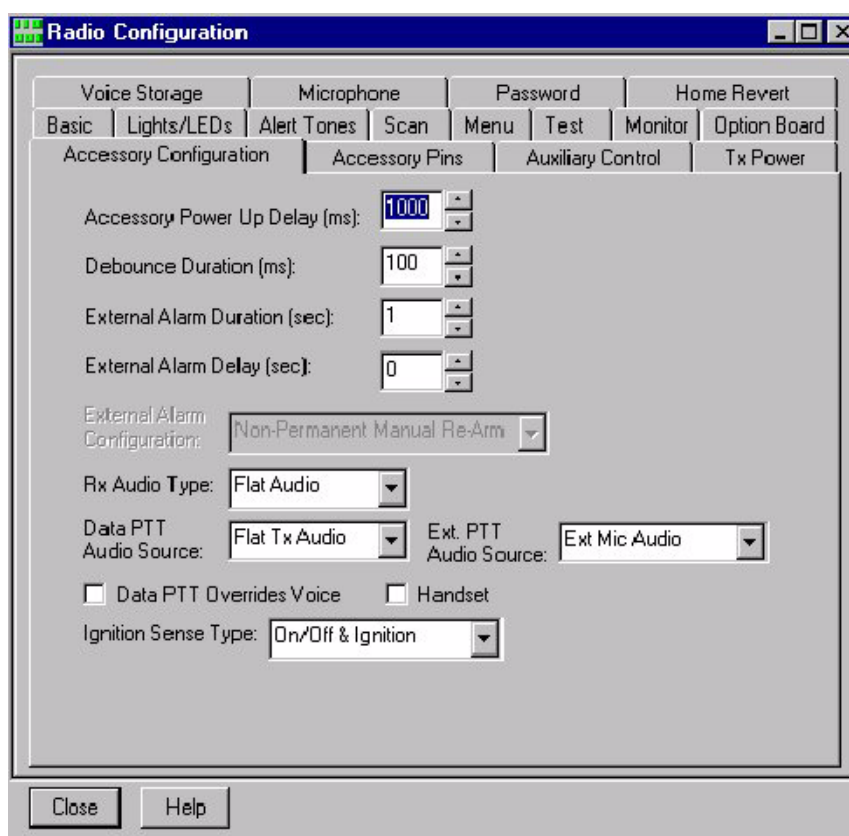
CONFIGURING THE BASE AND MOBILE RADIOS IN CPS – DATA AND VOICE ON THE SAME TALKGROUP

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-12). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-12 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-13), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-13 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

CONFIGURING THE BASE AND MOBILE RADIOS IN PPCPS – DATA AND VOICE ON THE SAME TALKGROUP

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

ENABLING THE PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-14).

- Under Primary Talkgroup, clear the **Disable Priority** check box to enable the priority talkgroup.

FIGURE 2-14 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window has a title bar with a globe icon and standard window controls. The 'System Info' tab is active, showing fields for Identification and Features. The 'Identification' section includes 'Zone Alias' (CORPORATE), 'Mobile Identity Number (MIN)' (157), 'Primary Group ID' (60000), 'Home System ID (HSID)' (849), and 'Affiliated System ID (ASID)' (40). The 'Features' section includes checkboxes for 'Invert Rx Data', 'Invert Tx Data', 'Disable Roam', 'Disable ATB Ring Back', 'Enable PP Group Scan' (checked), and 'Interconnect Companding' (checked). The 'Primary Talkgroup' section includes checkboxes for 'Disable Priority' and 'Disable Transmit'. An 'Edit Talk Groups' button is located below the Identification fields. At the bottom of the window, there is a status bar showing '1 of 5' and navigation buttons (back, forward, search, etc.), and a 'Done' and 'Cancel' button.

Tab	Field	Value
System Info	Zone Alias	CORPORATE
	Mobile Identity Number (MIN)	157
	Primary Group ID	60000
	Home System ID (HSID)	849
	Affiliated System ID (ASID)	40
Features	Invert Rx Data	<input type="checkbox"/>
	Invert Tx Data	<input type="checkbox"/>
	Disable Roam	<input type="checkbox"/>
	Disable ATB Ring Back	<input type="checkbox"/>
	Enable PP Group Scan	<input checked="" type="checkbox"/>
	Interconnect Companding	<input checked="" type="checkbox"/>
Primary Talkgroup	Disable Priority	<input type="checkbox"/>
	Disable Transmit	<input type="checkbox"/>

MUTING ON THE DATA/VOICE TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-15).

- For the Data/Voice talkgroup (the one you will use for voice and data), select the **RX Mute for Data** check box. This selection mutes the first 750 ms of data if the Radio Configuration Options screen is set for **Rx Mute Timer for Data**.

FIGURE 2-15 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPand	Horn and Lights	Rx Mute for Data
Primary	1 60000	Primary	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2 59999	Data / Voice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	3 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

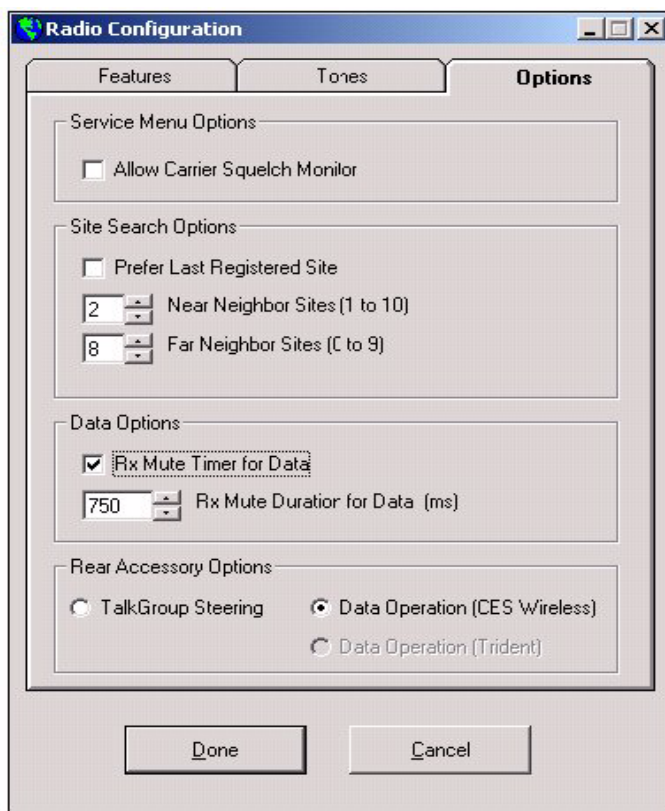
Done Cancel

MUTING ON THE DATA/VOICE TALKGROUP – PART 2

Choose the following settings on the **Options** tab of the Radio Configuration dialog box (Figure 2-16).

- For the Mobile radio, select the **Rx Mute Timer for Data** check box and select **750 ms** for the **Rx Mute Duration for Data (ms)** list. This selection mutes the voice/data talkgroup for the first 750 ms of each call.
- On the Base radio, clear the **Rx Mute Timer for Data** check box. This selection mutes all activity on the data/voice talkgroup.

FIGURE 2-16 PPCPS RADIO CONFIGURATION OPTIONS TAB



CONFIGURING THE TRK-240 – DATA AND VOICE ON THE SAME TALKGROUP

Use the TRK-240 Programming Software from CES Wireless Technologies to select the settings for data on the TRK-240 mobile data terminal.

SETTING UP THE RADIO TAB

On the **Radio** tab, set the following key areas as shown in Figure 2-17.

- In the Radio Interface area:
 - **Baud Rate** list: select **1200**.
 - **Radio Type** list: select **LTR** for PassPort radios.
 - **Lead in Delay**: type the time as shown from clear-to-send to start of data.
- In the Busy area:
 - **Frame Transmit Function** list: select **Before and After Channel Change**.
 - **Holdoff Time** box: type the time as shown, which means that the radio waits this long after a busy clears before keying.
 - **Busy must be active to receive frames** check box: select this to only decode data when the talkgroup is active.
- In the Frame Transmit area:
 - **Ack Wait Time** box: type the time as shown, which means that the radio waits this long for the Acknowledgement before resending data message.
 - **Retry Window**: type the time as shown, which means that the radio waits a random time before resending data but sends data within this window.
 - **Repeat Count** box: type the time as shown, which is the number of attempts to send data message.
 - **Ack Response Time** box: type the time as shown, which is the amount of time to wait after receiving a message and sending an ACK.



NOTE

Changing other parameters may result in impaired system performance.

FIGURE 2-17 RADIO TAB

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I/O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Unit ID:
 System ID: Unit ID:

Radio Interface:
 Baud Rate:
 Radio Type:
 Lead In Delay: x 10ms
 Request Check: x 1ms
 Request Window: x 10ms
 Grant Check: x 10ms
 Grant Window: x 10ms

Encryption:
 Encrypt 1: Encrypt 2: Encrypt 3:

Group ID's:
 Group 1: Group 6:
 Group 2: Group 7:
 Group 3: Group 8:
 Group 4: Group 9:
 Group 5: Group 10:

Busy:
☐ Ignore When Sending Acks
☒ Ignore When PTT In Is Active
 Frame Transmit Function:
 Holdoff Time: x 10ms
☒ Busy must be active to receive frames

Frame Transmit:
 Ack Wait Time: x 10ms Retry Window: x 10ms
 Repeat Count: Ack Response Time: x 10ms

CONFIGURING THE CHANNEL CHANGE SETTINGS

Select the following settings on the **Channel Change** tab (Figure 2-18).

- Select **Off** on the **Channel Change Before Data is Sent** list and the **Channel Change After Data is Sent** list.



NOTE

You do not want the radio to revert to the primary talkgroup to send data, so you must turn off Channel Change before and after data is sent.

FIGURE 2-18 CHANNEL CHANGE

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I/O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Channel Change - Before Data Is Sent

Off

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: Before channel is accessed

Channel Change - After Data Is Sent

Off

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: Alter ack is received

☐ Release PTT After Channel Change for Acks

Acknowledgments

☐ Perform channel change

☒ Decrement retries on channel access error

☐ Enable strip turnoff code on Aux Out 1

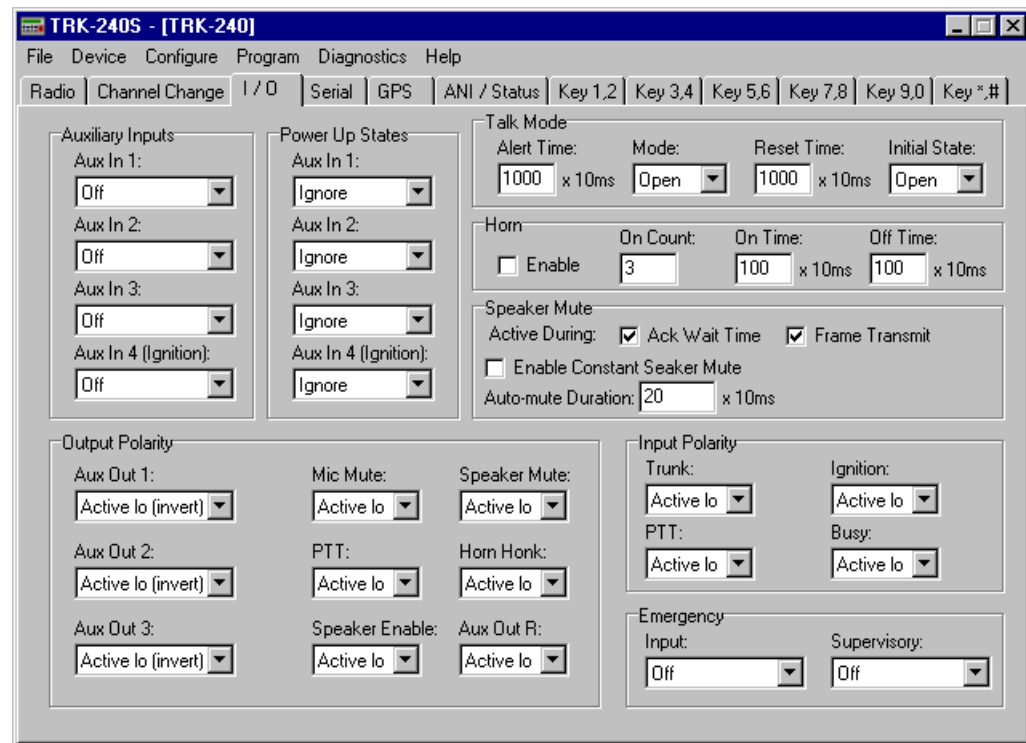
Registration input: Aux in 1: active low

SETTING UP THE I/O TAB

On the **I/O** tab, set the **Speaker Mute** area as shown in Figure 2-19. This mutes the speaker while waiting for the ACK, and when transmitting.

The rest of the screen is user specific, and not related to PassPort operation.

FIGURE 2-19 I/O TAB



SETTING UP THE ANI/STATUS TAB

On the **ANI/Status** tab, set the **PTT Functions**, **Long Term Queue**, and **Short Term Queue** areas as shown in Figure 2-20.

FIGURE 2-20 ANI/STATUS TAB

TRK-240S - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I / O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

ANI

☐ Leading ☐ Trailing

☐ Random Random Window Time: 500 x 10ms

ANI Holdoff

Count: 0 0 = Off Reset Time: 3000 x 10ms

PTT Functions

Double Click: Off TX Limit: 10000 x 10ms

Stuck Mic: 12000 x 10ms TX Penalty: 500 x 10ms

Guard Time: 300 x 10ms ☒ Disconnect PTT In from PTT Out

Long Term Queue

Procedure Time: 5 Minutes

Repeat Count: 100

Short Term Queue

Ack Wait Time: 500 x 10ms

Repeat Count: 4

Retry Window: 500 x 10ms

Remote Key Masking

☐ Enable

Display / Audio Functions

Backlight: On With Activity Alert Type: Buzzer

Queue Size: 25 Messages Alert Time: 150 x 10ms

☐ Disable Work Order Ack

CONFIGURATION 3: DATA ON PRIMARY – VOICE/DATA ON SECONDARY (TWO RADIOS)

This section explains how to configure Data on Primary, Voice/Data on Secondary for the following:

- MDC-150 data modem
- Base radios
 - Base radio on the primary and secondary talkgroup
 - Base radio on the primary talkgroup (radio connected to Modem A)
 - Base radio on the secondary talkgroup (radio connected to Modem B)
- Mobile radios
- TRK-240 mobile data terminal

CONFIGURING THE MDC-150 – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Using MDC-150 Programming software from CES Wireless Technologies, configure the MDC-150 data modem located at the fixed Base location. Do the following:

1. Select **MDC**, and then select **Program unit**.
2. Select the settings on the Edit Unit Parameters dialog box:
 - “Configuring the Base MDC-150 Connected to the Radio on the Primary Talkgroup” on page 2-25
 - “Configuring the Base MDC-150 Connected to the Radio on the Secondary Talkgroup” on page 2-26

CONFIGURING THE BASE MDC-150 CONNECTED TO THE RADIO ON THE PRIMARY TALKGROUP

Select the following settings on the Edit Unit Parameters dialog box (Figure 2-21):

- In the **MDC Address** box, type **a**.
The modem connected to the radio on the primary talkgroup is addressed as unit A.
- In the **Retry Number** box, type **0**.
Since the Retry Number is set to 0, the base computer will not send outbound data to this modem.

FIGURE 2-21 EDIT UNIT PARAMETERS

The screenshot shows the 'Edit Unit Parameters' dialog box with the following settings:

- Radio Parameters:**
 - MDC Address: **a**
 - System ID: **0**
 - Radio Type: **LTR**
 - Lead In Delay: **50** x10ms
 - Busy/Request: **10** ms
 - Request Window: **350** x10ms
 - Grant Check: **2** x10ms
 - Grant Window: **400** x10ms
 - Baud Rate: **1200**
 - Min TX Time: **10** x10ms
 - String Train Time: **0**
 - AT Comm. Mode: **Regular**
- Acknowledgement:**
 - Wait Time: **500** x10ms
 - Response: **10** x10ms
 - Perform Channel Change: ☐
- Retry:**
 - Time Window: **900** x10ms
 - Number: **0**
- Polarity:**
 - Spkr Enable: **Active Lo**
 - Spkr Mute: **Active Lo**
 - Mic Mute: **Active Lo**
 - Busy: **Active Lo**
 - PTT In: **Active Lo**
 - PTT Out: **Active Lo**
 - Aux 1: **Active Hi**
 - Trunk: **Active Lo**
- Encryption:**
 - Key 1: **0**
 - Key 2: **0**
 - Key 3: **0**
- Channel Change Before Data is Sent:**
 - Count: **1**
 - Timer 1: **0** x10ms
 - Timer 2: **0** x10ms
 - Change: **Before channel is acce**
 - Type: **Off**
- Channel Change After Data is Sent:**
 - Count: **1**
 - Timer 1: **0** x10ms
 - Timer 2: **0** x10ms
 - Change: **When frame is sent**
 - Type: **Off**
 - Release PTT after Channel Change for Acks: ☐
- Busy:**
 - Ignore Busy For Acks: ☐
 - Ignore Busy For PTT: ☒
 - Holdoff Time: **100** x10ms
- Frame Transmit Function:** **Before & After Channel Change**
- Busy Must Be Active To Receive:** ☒
- Enable Strip Turnoff on Aux Out 1:** ☐

Buttons: **Send** and **Cancel**

CONFIGURING THE BASE MDC-150 CONNECTED TO THE RADIO ON THE SECONDARY TALKGROUP

Select the following settings on the Edit Unit Parameters dialog box (Figure 2-22):

- In the **MDC Address** box, type **b**.
The modem connected to the radio on the secondary talkgroup is addressed as unit B.
- In the **Retry Number** box, type **3**.
Since the Retry Number is set to 3, the base computer will send outbound data to this modem, and will retry three times if unsuccessful.

FIGURE 2-22 EDIT UNIT PARAMETERS

The screenshot shows the 'Edit Unit Parameters' dialog box with the following settings:

- Radio Parameters:**
 - MDC Address: **b**
 - System ID: **0**
 - Radio Type: **LTR**
 - Lead In Delay: **50** x10ms
 - Busy/Request: **10** ms
 - Request Window: **350** x10ms
 - Grant Check: **2** x10ms
 - Grant Window: **400** x10ms
 - Baud Rate: **1200**
 - Min TX Time: **10** x10ms
 - Sting Time: **0**
 - AT Comm. Mode: **Regular**
- Acknowledgement:**
 - Wait Time: **500** x10ms
 - Response: **10** x10ms
 - Perform Channel Change: ☐
- Retry:**
 - Time Window: **900** x10ms
 - Number: **3**
- Polarity:**
 - Spkr Enable: **Active Lo**
 - Spkr Mute: **Active Lo**
 - Mic Mute: **Active Lo**
 - Busy: **Active Lo**
 - PTT In: **Active Lo**
 - PTT Out: **Active Lo**
 - Aux 1: **Active Hi**
 - Trunk: **Active Lo**
- Encryption:**
 - Key 1: **0**
 - Key 2: **0**
 - Key 3: **0**
- Channel Change Before Data is Sent:**
 - Count: **1**
 - Timer 1: **0** x10ms
 - Timer 2: **0** x10ms
 - Change: **Before channel is acce**
 - Type: **Off**
- Channel Change After Data is Sent:**
 - Count: **1**
 - Timer 1: **0** x10ms
 - Timer 2: **0** x10ms
 - Change: **When frame is sent**
 - Type: **Off**
 - Release PTT after Channel Change for Acks: ☐
- Busy:**
 - Ignore Busy For Acks: ☐
 - Ignore Busy For PTT: ☒
 - Holdoff Time: **100** x10ms
 - Frame Transmit Function: **Before & After Channel Change**
 - Busy Must Be Active To Receive: ☒
- Enable Strip Turnoff on Aux Out 1:** ☐
- Buttons:** **Send** and **Cancel**

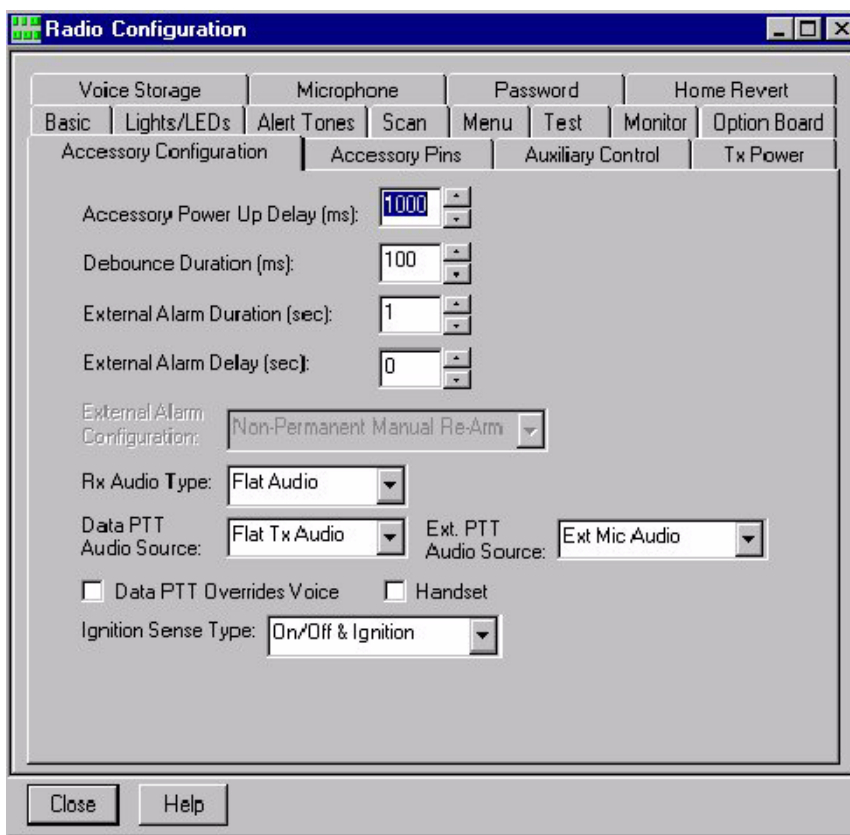
CONFIGURING THE BASE RADIO ON THE PRIMARY AND SECONDARY TALKGROUP - DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-23). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-23 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-24), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-24 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Radio Configuration

Voice Storage | Microphone | Password | Home Revert

Basic | Lights/LEDs | Alert Tones | Scan | Menu | Test | Monitor | Option Board

Accessory Configuration | **Accessory Pins** | Auxiliary Control | Tx Power

Accessory Package: Default

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

Close Help

CONFIGURING THE BASE RADIO ON THE PRIMARY TALKGROUP (RADIO CONNECTED TO MODEM A) – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

ENABLING THE PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-25).

- Under Primary Talkgroup, clear the **Disable Priority** check box to enable the priority talkgroup.

FIGURE 2-25 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window contains the following elements:

- System Info Tab:** The active tab, with other tabs being 'Channel Data', 'System Timers', 'Timeout Timers', and 'RSSI'.
- Identification Section:**
 - Zone Alias:** A text field containing 'CORPORATE'.
 - Mobile Identity Number (MIN):** A text field containing '157'.
 - Primary Group ID:** A text field containing '60000'.
 - Home System ID (HSID):** A text field containing '849'.
 - Affiliated System ID (ASID):** A text field containing '40'.
- Features Section:**
 - ☐ Invert Rx Data
 - ☐ Invert Tx Data
 - ☐ Disable Roam
 - ☐ Disable ATB Ring Back
 - ☒ Enable PP Group Scan
 - ☒ Interconnect Companding
- Primary Talkgroup Section:**
 - ☐ Disable Priority
 - ☐ Disable Transmit
- Edit Talk Groups:** A button located below the Identification fields.
- Navigation and Controls:**
 - A '1 of 5' indicator.
 - A set of navigation buttons: back, forward, and a red 'X' button.
 - 'Done' and 'Cancel' buttons at the bottom.

MUTING ALL ACTIVITY ON THE PRIMARY TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-26).

- For the primary talkgroup, select the **RX Mute for Data** check box.

FIGURE 2-26 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPend	Horn and Lights	Rx Mute for Data
Primary	1 60000	Data Talkgroup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	2 59999	Voice / Data TG	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

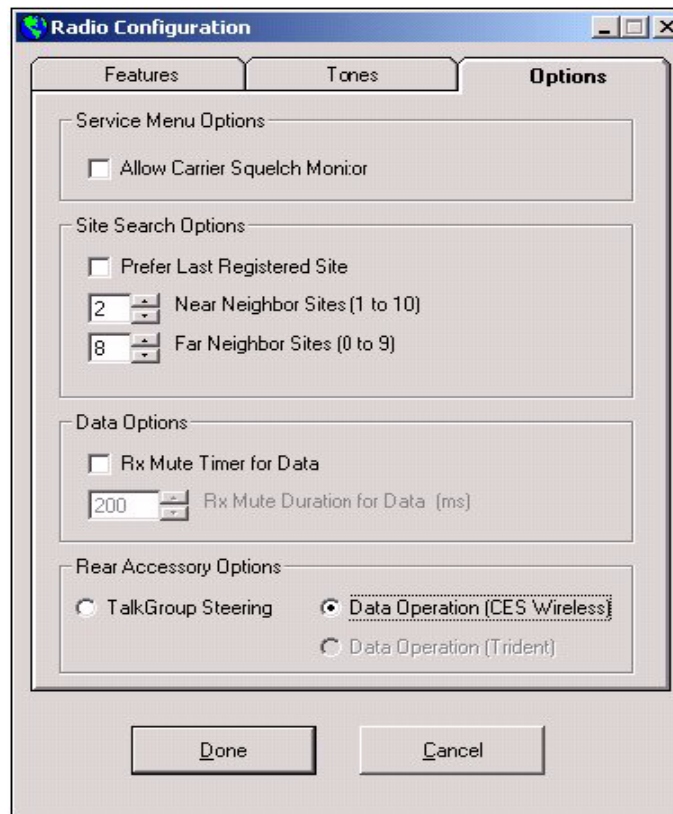
Done Cancel

MUTING ALL ACTIVITY ON THE PRIMARY TALKGROUP – PART 2

On the **Options** tab of the Radio Configuration dialog box (Figure 2-27), set as follows:

- Clear the **Rx Mute Timer for Data** check box. This completely mutes Primary Talkgroup activity since you checked **Rx Mute for Data** on the TalkGroup Data dialog box.

FIGURE 2-27 PPCPS RADIO CONFIGURATION OPTIONS TAB



CONFIGURING THE BASE RADIO ON THE SECONDARY TALKGROUP (RADIO CONNECTED TO MODEM B) – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

DISABLING PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-28).

- Under Primary Talkgroup, select the **Disable Priority** check box, so that the radio will only monitor the secondary talkgroup.

FIGURE 2-28 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The 'Identification' section contains the following fields:

- Zone Alias: CORPORATE
- Mobile Identity Number (MIN): 157
- Primary Group ID: 60000
- Home System ID (HSID): 849
- Affiliated System ID (ASID): 40

The 'Features' section contains the following checkboxes:

- ☐ Invert Rx Data
- ☐ Invert Tx Data
- ☐ Disable Roam
- ☐ Disable ATB Ring Back
- ☒ Enable PP Group Scan
- ☒ Interconnect Companding

The 'Primary Talkgroup' section contains the following checkboxes:

- ☒ Disable Priority
- ☐ Disable Transmit

At the bottom of the window, there is an 'Edit Talk Groups' button, a '1 of 5' indicator, a set of navigation buttons (back, forward, search, etc.), and 'Done' and 'Cancel' buttons.

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-29).

- For the Voice/Data talkgroup, select the **RX Mute for Data** check box.

FIGURE 2-29 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPend	Horn and Lights	Rx Mute for Data
Primary	1	60000	Primary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	2	59999	Voice / Data TG	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	3	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	4	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	5	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	6	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	7	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	8	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	9	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	10	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	11	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	12	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	13	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	14	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	15	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	16	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

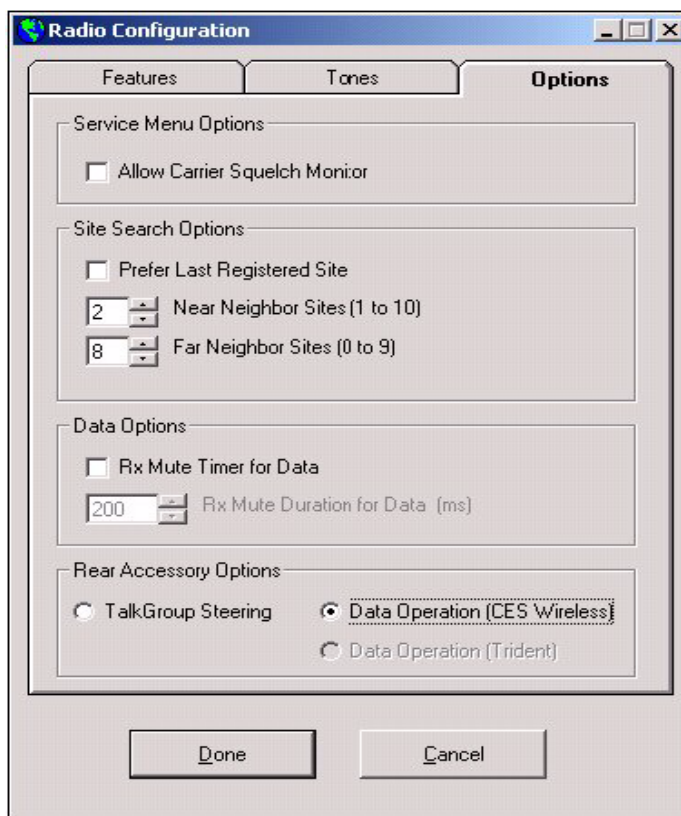
Done Cancel

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 2

Choose the following setting on the **Options** tab of the Radio Configuration dialog box (Figure 2-30).

- Clear the **Rx Mute Timer for Data** check box. This completely mutes Secondary Talkgroup activity since you checked **Rx Mute for Data** on the TalkGroup Data dialog box for the secondary talkgroup.

FIGURE 2-30 PPCPS RADIO CONFIGURATION OPTIONS TAB



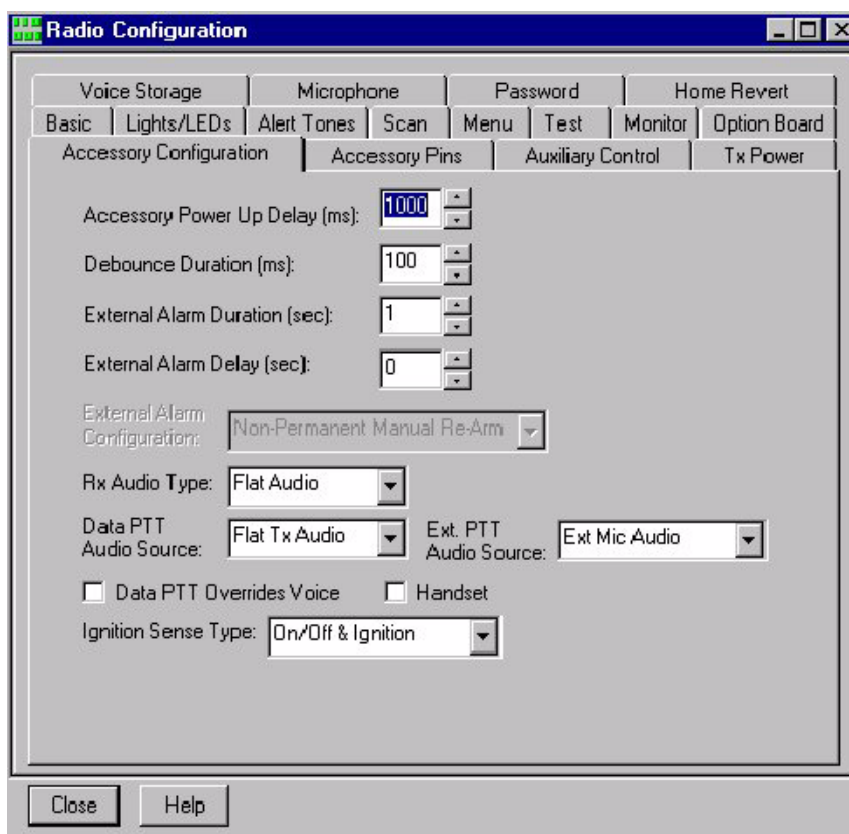
CONFIGURING THE MOBILE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-31). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-31 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-32), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-32 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

Accessory Package: Default

Close Help

CONFIGURING THE MOBILE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

DISABLING PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-33).

- Under Primary Talkgroup, select the **Disable Priority** check box.

FIGURE 2-33 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window is divided into several sections:

- Identification:**
 - Zone Alias: CORPORATE
 - Mobile Identity Number (MIN): 157
 - Primary Group ID: 60000
 - Home System ID (HSID): 849
 - Affiliated System ID (ASID): 40
- Features:**
 - ☐ Invert Rx Data
 - ☐ Invert Tx Data
 - ☐ Disable Roam
 - ☐ Disable ATB Ring Back
 - ☒ Enable PP Group Scan
 - ☒ Interconnect Companding
- Primary Talkgroup:**
 - ☒ Disable Priority
 - ☐ Disable Transmit

At the bottom of the window, there is a navigation bar with the text '1 of 5' and a set of navigation buttons (back, forward, search, etc.). Below the navigation bar are 'Done' and 'Cancel' buttons.

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-34).

- For the Data/Voice talkgroup (secondary talkgroup), select the **RX Mute for Data** check box.

FIGURE 2-34 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPand	Horn and Lights	Rx Mute for Data
Primary	1 60000	Primary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2 59999	Data / Voice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	3 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Done Cancel



NOTE

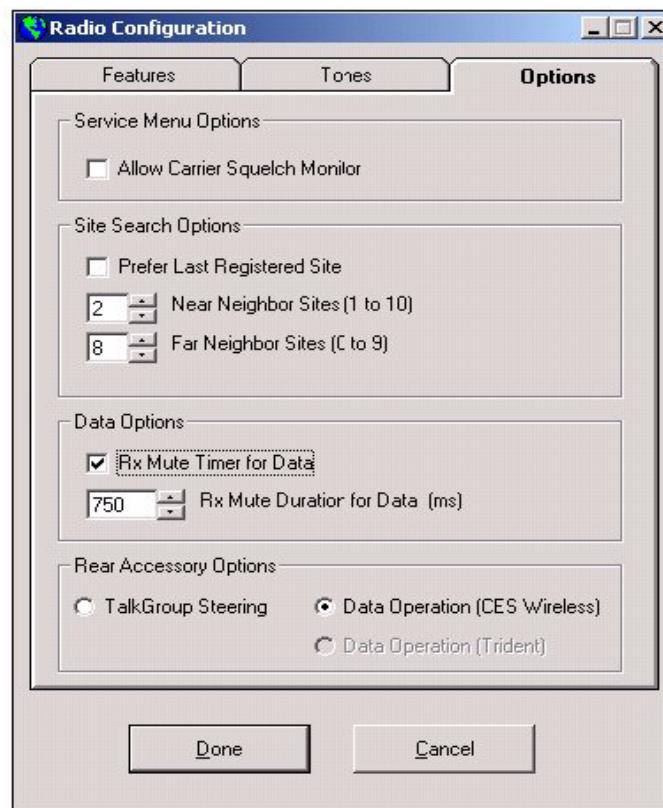
The XPand setting must be the same for the Primary (Data) and Secondary (Data/Voice) talkgroup.

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 2

Choose the following settings on the **Options** tab of the Radio Configuration dialog box (Figure 2-35).

- Select the **Rx Mute Timer for Data** check box and select **750 ms** for the **Rx Mute Duration for Data (ms)** list. This selection mutes the voice/data talkgroup for the first 750 ms of each call.

FIGURE 2-35 PPCPS RADIO CONFIGURATION OPTIONS TAB



CONFIGURING THE TRK-240 – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use the TRK-240 Programming Software from CES Wireless Technologies to select the settings for data on the TRK-240 mobile data terminal.

SETTING UP THE RADIO TAB

On the **Radio** tab, set the following key areas as shown in Figure 2-36.

- In the Radio Interface area:
 - **Baud Rate** list: select **1200**.
 - **Radio Type** list: select **LTR** for PassPort radios.
 - **Lead in Delay**: type the time as shown from clear-to-send to start of data.
- In the Busy area:
 - **Frame Transmit Function** list: select **Before and After Channel Change**.
 - **Holdoff Time** box: type the time as shown, which means that the radio waits this long after a busy clears before keying.
 - **Busy must be active to receive frames** check box: select this to only decode data when the talkgroup is active.
- In the Frame Transmit area:
 - **Ack Wait Time** box: type the time as shown, which means that the radio waits this long for the Acknowledgement before resending data message.
 - **Retry Window**: type the time as shown, which means that the radio waits a random time before resending data but sends data within this window.
 - **Repeat Count** box: type the time as shown, which is the number of attempts to send data message.
 - **Ack Response Time** box: type the time as shown, which is the amount of time to wait after receiving a message and sending an ACK.



NOTE

Changing other parameters may result in impaired system performance.

FIGURE 2-36 RADIO TAB

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I / ID Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Unit ID

System ID: Unit ID:

Group ID's

Group 1: Group 6:
 Group 2: Group 7:
 Group 3: Group 8:
 Group 4: Group 9:
 Group 5: Group 10:

Radio Interface

Baud Rate:

Radio Type:

Lead In Delay: x 10ms

Request Check: x 1ms

Request Window: x 10ms

Grant Check: x 10ms

Grant Window: x 10ms

Encryption

Encrypt 1: Encrypt 2: Encrypt 3:

Busy

☐ Ignore When Sending Acks
☒ Ignore When PTT In Is Active
 Frame Transmit Function:
 Holdoff Time: x 10ms
☒ Busy must be active to receive frames

Frame Transmit

Ack Wait Time: x 10ms Retry Window: x 10ms
 Repeat Count: Ack Response Time: x 10ms

SETTING UP THE CHANNEL CHANGE TAB

On the **Channel Change** tab, set the following key areas as shown in Figure 2-37:

- Channel Change - Before Data is Sent area:
 - **Timer 2:** This is the time given to the radio to change to the primary Talkgroup.
- Channel Change - After Data is Sent area:
 - **Timer 2:** This is the time given to the radio to change back to the Secondary Talkgroup.
 - **Change list:** Select **After ack is received**. Stays on Primary Talkgroup until ACK is received.
- Acknowledgements area:
 - Clear the **Perform channel change** check box. Do not revert to the Primary Talkgroup to send ACK to data received on the secondary talkgroup.



NOTE

Other fields are important as well, but set them according to your system requirements.

FIGURE 2-37 CHANNEL CHANGE

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I/O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Channel Change - Before Data Is Sent

Activate aux out R

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: Before channel is accessed

Channel Change - After Data Is Sent

Deactivate aux out R

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: After ack is received

☐ Release PTT After Channel Change for Acks

Acknowledgments

☐ Perform channel change

☒ Decrement retries on channel access error

☐ Enable strip turnoff code on Aux Out 1

Registration input: Aux in 1: active low

SETTING UP THE I/O TAB

On the **I/O** tab, set the **Speaker Mute** area as shown in Figure 2-38. This mutes the speaker while waiting for the ACK, and when transmitting.

The rest of the screen is user specific, and not related to PassPort operation.

FIGURE 2-38 I/O TAB

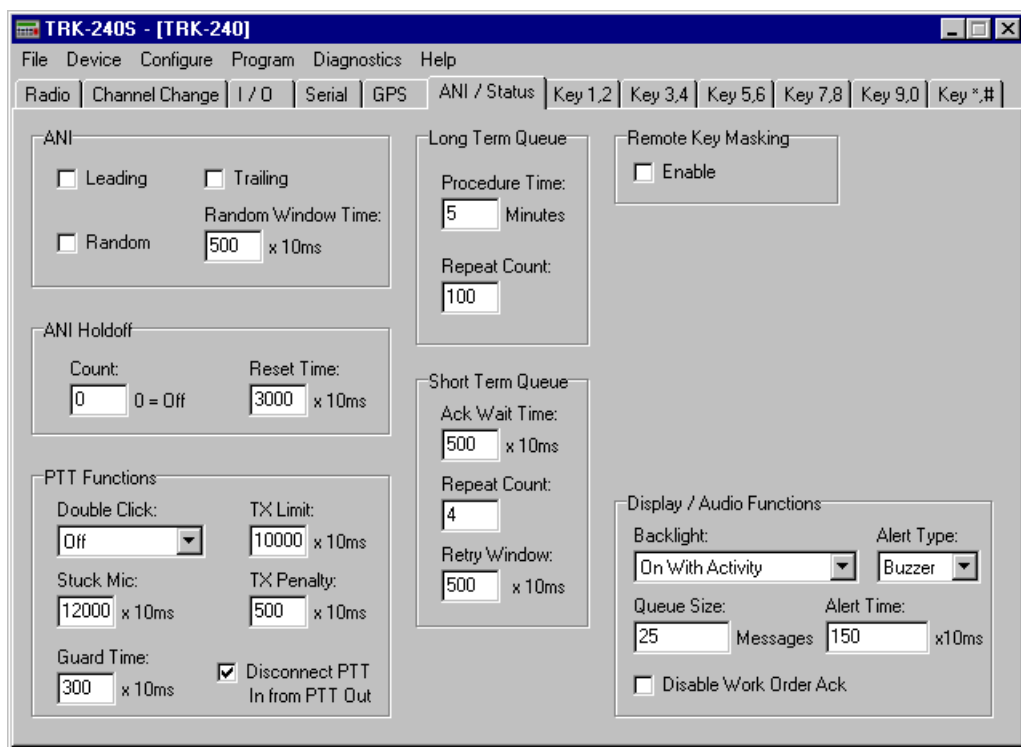
The screenshot shows the 'I/O' tab of the TRK-240S configuration software. The window title is 'TRK-240S - [TRK-240]'. The menu bar includes File, Device, Configure, Program, Diagnostics, and Help. The tab bar shows Radio, Channel Change, I/O (selected), Serial, GPS, ANI / Status, Key 1,2, Key 3,4, Key 5,6, Key 7,8, Key 9,0, and Key *,#. The main area is divided into several sections:

- Auxiliary Inputs:** Aux In 1, 2, 3, and 4 (Ignition) are all set to 'Off'.
- Power Up States:** Aux In 1, 2, 3, and 4 (Ignition) are all set to 'Ignore'.
- Talk Mode:** Alert Time is 1000 x 10ms, Mode is Open, Reset Time is 1000 x 10ms, and Initial State is Open.
- Horn:** Enable is unchecked, On Count is 3, On Time is 100 x 10ms, and Off Time is 100 x 10ms.
- Speaker Mute:** Active During is checked for Ack Wait Time and Frame Transmit. Enable Constant Seaker Mute is unchecked. Auto-mute Duration is 20 x 10ms.
- Output Polarity:** Aux Out 1, 2, and 3 are all set to 'Active lo (invert)'. Mic Mute, PTT, and Speaker Enable are all set to 'Active lo'. Speaker Mute and Horn Honk are both set to 'Active lo'. Aux Out R is set to 'Active lo'.
- Input Polarity:** Trunk and PTT are both set to 'Active lo'. Ignition and Busy are both set to 'Active lo'.
- Emergency:** Input is set to 'Off' and Supervisory is set to 'Off'.

SETTING UP THE ANI/STATUS TAB

On the **ANI/Status** tab, set the **PTT Functions**, **Long Term Queue**, and **Short Term Queue** areas as shown in Figure 2-39.

FIGURE 2-39 ANI/STATUS TAB



CONFIGURATION 4: DATA ON PRIMARY, VOICE/DATA ON SECONDARY (ONE RADIO)

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This section explains how to configure Data on Primary, Voice/Data on Secondary for the following:

- MDC-150 data modem
- Base radios
 - One Base radio on the primary and secondary talkgroup
- Mobile radios
- TRK-240 mobile data terminal

CONFIGURING THE MDC-150 – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Using MDC-150 Programming software from CES Wireless Technologies, configure the MDC-150 data modem located at the fixed Base location.

CONFIGURING THE BASE MDC-150

Select **MDC**, and then select **Program unit**.

Select the following settings on the Edit Unit Parameters dialog box (Figure 2-40):

- In the **MDC Address** box, type **a**.
- In the **Retry Number** box, type **3**.

Since the **Retry Number** is set to 3, the base computer will send outbound data to this modem, and will retry three times if unsuccessful.

FIGURE 2-40 EDIT UNIT PARAMETERS

Edit Unit Parameters

Radio Parameters MDC Address: <input type="text" value="a"/> System ID: <input type="text" value="0"/> Radio Type: <input type="text" value="LTR"/> Lead In Delay: <input type="text" value="50"/> x10ms Busy/Request: <input type="text" value="10"/> ms Request Window: <input type="text" value="350"/> x10ms Grant Check: <input type="text" value="2"/> x10ms Grant Window: <input type="text" value="400"/> x10ms Baud Rate: <input type="text" value="1200"/> Min TX Time: <input type="text" value="10"/> x10ms String Term Time: <input type="text" value="0"/> AT Comm. Mode: <input type="text" value="Regular"/>	Polarity Spkr Enable: <input type="text" value="Active Lo"/> Spkr Mute: <input type="text" value="Active Lo"/> Mic Mute: <input type="text" value="Active Lo"/> Busy: <input type="text" value="Active Lo"/> PTT In: <input type="text" value="Active Lo"/> PTT Out: <input type="text" value="Active Lo"/> Aux 1 Out: <input type="text" value="Active Hi"/> Trunk: <input type="text" value="Active Lo"/>	Channel Change Before Data is Sent Count: <input type="text" value="1"/> Timer 1: <input type="text" value="0"/> x10ms Timer 2: <input type="text" value="0"/> x10ms Change: <input type="text" value="Before channel is ac"/> Type: <input type="text" value="Off"/>
Acknowledgement Wait Time: <input type="text" value="500"/> x10ms Response: <input type="text" value="10"/> x10ms Perform Channel Change: <input type="checkbox"/>	Encryption Key 1: <input type="text" value="0"/> Key 2: <input type="text" value="0"/> Key 3: <input type="text" value="0"/>	Channel Change After Data is Sent Count: <input type="text" value="1"/> Timer 1: <input type="text" value="0"/> x10ms Timer 2: <input type="text" value="0"/> x10ms After Ack Change: <input type="text" value="After Ack is received"/> Type: <input type="text" value="Off"/> Release PTT after Channel Change for Acks: <input type="checkbox"/>
Retry Time Window: <input type="text" value="900"/> x10ms Number: <input type="text" value="3"/>	Busy Ignore Busy For Acks: <input type="checkbox"/> Ignore Busy For PTT: <input checked="" type="checkbox"/> Holdoff Time: <input type="text" value="100"/> x10ms Frame Transmit Function: <input type="text" value="Before & After Channel Change"/> Busy Must Be Active To Recieve: <input checked="" type="checkbox"/>	Strip Enable Strip Turnoff On Aux Out 1: <input type="checkbox"/>

Click the **Program** button after you finish configuring the MDC-150.

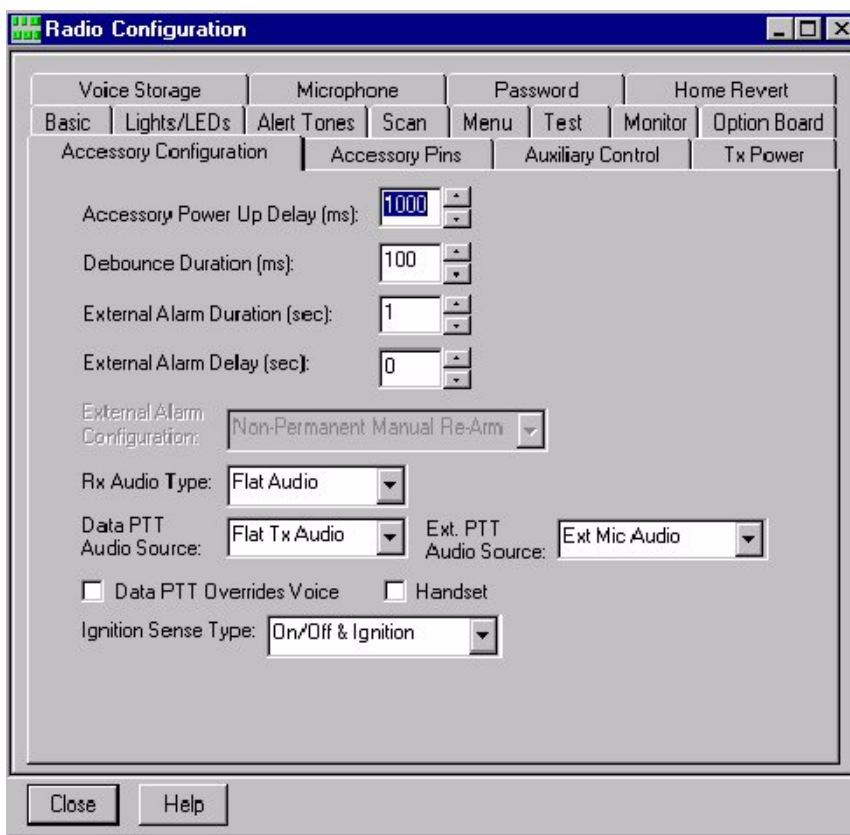
CONFIGURING THE BASE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-41). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-41 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-42), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-42 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Radio Configuration

Accessory Package: **Default**

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

Close Help

CONFIGURING THE BASE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

ENABLING THE PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-43).

- Under Primary Talkgroup, clear the **Disable Priority** check box to enable the priority talkgroup.

FIGURE 2-43 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window is divided into several sections:

- Identification:**
 - Zone Alias: CORPORATE
 - Mobile Identity Number (MIN): 157
 - Primary Group ID: 60000
 - Home System ID (HSID): 849
 - Affiliated System ID (ASID): 40
- Features:**
 - ☐ Invert Rx Data
 - ☐ Invert Tx Data
 - ☐ Disable Roam
 - ☐ Disable ATB Ring Back
 - ☒ Enable PP Group Scan
 - ☒ Interconnect Companding
- Primary Talkgroup:**
 - ☐ Disable Priority
 - ☐ Disable Transmit

At the bottom of the window, there is a navigation bar with '1 of 5' and several arrow buttons, and a 'Done' button.

MUTING ALL ACTIVITY ON THE PRIMARY TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-44).

- For the primary talkgroup, select the **RX Mute for Data** check box.

FIGURE 2-44 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPend	Horn and Lights	Rx Mute for Data
Primary	1 60000	Data Talkgroup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	2 59999	Voice / Data TG	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

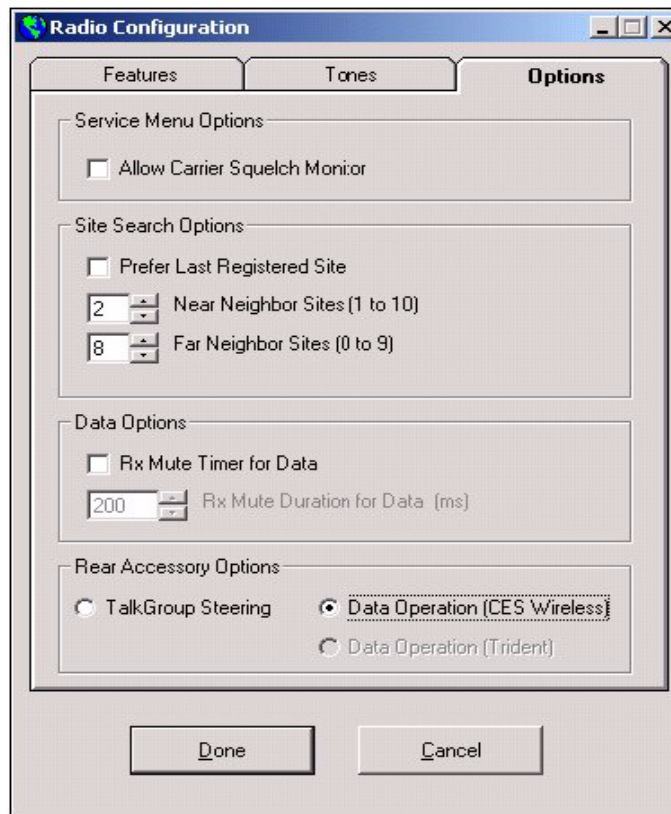
Done Cancel

MUTING ALL ACTIVITY ON THE PRIMARY TALKGROUP – PART 2

On the **Options** tab of the Radio Configuration dialog box (Figure 2-45), set as follows:

- Clear the **Rx Mute Timer for Data** check box. This completely mutes Primary Talkgroup activity since you checked **Rx Mute for Data** on the TalkGroup Data dialog box.

FIGURE 2-45 PPCPS RADIO CONFIGURATION OPTIONS TAB



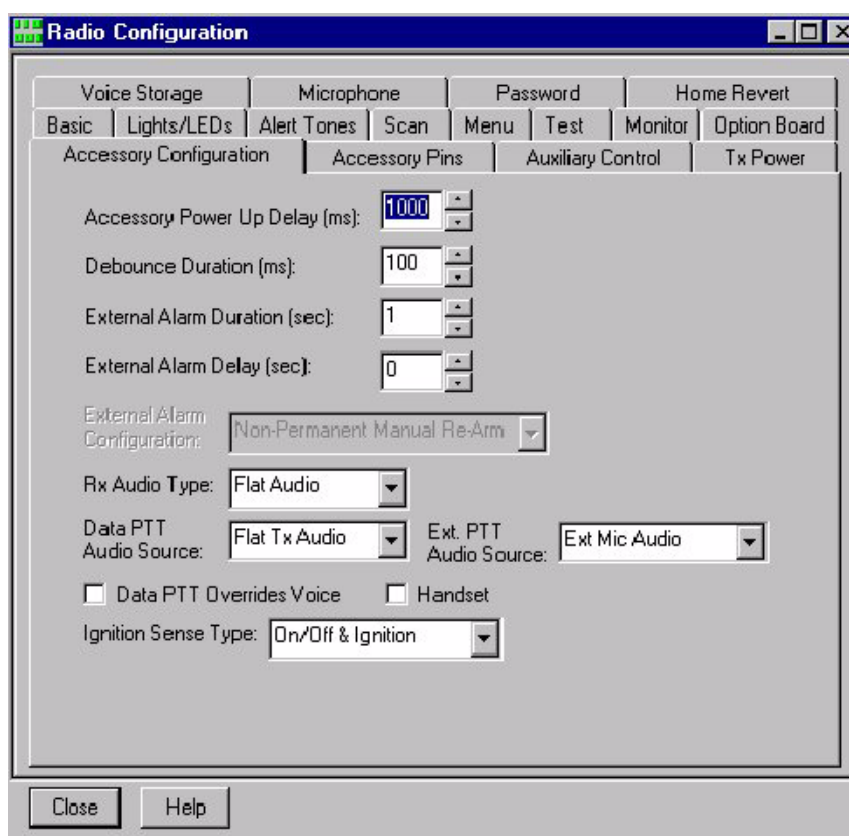
CONFIGURING THE MOBILE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use Professional Radio Customer Programming Software (CPS) to select the settings for data.

SETTING UP ACCESSORY CONFIGURATION

1. In the Radio Configuration window, select the **Accessory Configuration** tab (Figure 2-46). From the **Data PTT Audio Source** list, select **Flat Tx Audio**.
2. From the **Rx Audio Type** list, select **Flat Audio**.

FIGURE 2-46 CPS RADIO CONFIGURATION – ACCESSORY CONFIGURATION TAB



SETTING UP ACCESSORY PINS

On the **Accessory Pins** tab (Figure 2-47), select all fields as shown on the screen to set the pin functions for proper interface to the CES data device.

FIGURE 2-47 CPS RADIO CONFIGURATION – ACCESSORY PINS TAB

Pin #	Function Selection (Direction)	Active Level	Debounce Enable
3	Option Board 4 (Input)	Low	<input type="checkbox"/>
4	Option Board 2 (Output)	Low	<input type="checkbox"/>
6	Option Board 1 (Input)	Low	<input type="checkbox"/>
8	Option Board 1 (Output)	Low	<input type="checkbox"/>
9	Null	Low	<input type="checkbox"/>
12	Rx Audio Mute (Input)	Low	<input type="checkbox"/>
14	Option Board 4 (Output)	Low	<input type="checkbox"/>

Accessory Package: Default

Close Help

CONFIGURING THE MOBILE RADIO – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use PassPort Customer Programming Software (PPCPS) to select the settings for data.

DISABLING PRIORITY ON THE PRIMARY TALKGROUP

Choose the following setting on the **System Info** tab (Figure 2-48).

- Under Primary Talkgroup, select the **Disable Priority** check box.

FIGURE 2-48 SYSTEM INFO TAB

The screenshot shows the 'Radio Zone 1' window with the 'System Info' tab selected. The window has a title bar with 'Radio Zone 1' and standard window controls. Below the title bar are five tabs: 'System Info', 'Channel Data', 'System Timers', 'Timeout Timers', and 'RSSI'. The 'System Info' tab is active and contains the following sections:

- Identification:**
 - Zone Alias: CORPORATE
 - Mobile Identity Number (MIN): 157
 - Primary Group ID: 60000
 - Home System ID (HSID): 849
 - Affiliated System ID (ASID): 40
- Features:**
 - ☐ Invert Rx Data
 - ☐ Invert Tx Data
 - ☐ Disable Roam
 - ☐ Disable ATB Ring Back
 - ☒ Enable PP Group Scan
 - ☒ Interconnect Companding
- Primary Talkgroup:**
 - ☒ Disable Priority
 - ☐ Disable Transmit

At the bottom of the 'System Info' tab is an 'Edit Talk Groups' button. Below the tab content is a navigation bar with the text '1 of 5' and a series of navigation icons (back, forward, search, etc.). At the very bottom are 'Done' and 'Cancel' buttons.

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 1

Choose the following setting on the TalkGroup Data dialog box (Figure 2-49).

- For the Data/Voice talkgroup (secondary talkgroup), select the **RX Mute for Data** check box.

FIGURE 2-49 TALKGROUP DATA DIALOG BOX

	TalkGroup ID	TalkGroup Alias	PassPort Group Scan Member	XPand	Horn and Lights	Rx Mute for Data
Primary	1 60000	Primary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2 59999	Data / Voice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	3 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16 0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Done Cancel



NOTE

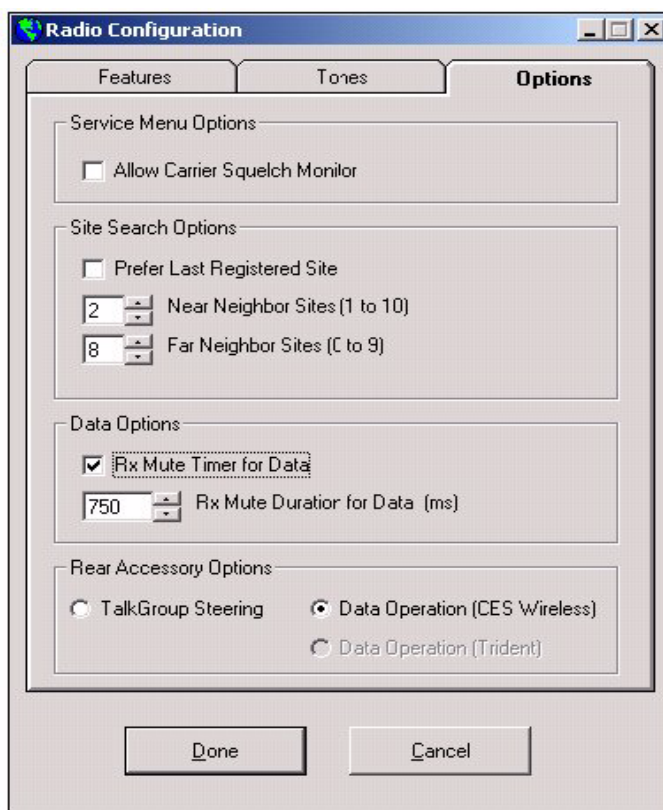
The XPand setting must be the same for the Primary (Data) and Secondary (Data/Voice) talkgroup.

MUTING ALL ACTIVITY ON THE SECONDARY TALKGROUP – PART 2

Choose the following settings on the **Options** tab of the Radio Configuration dialog box (Figure 2-50).

- Select the **Rx Mute Timer for Data** check box and select **750 ms** for the **Rx Mute Duration for Data (ms)** list. This selection mutes the voice/data talkgroup for the first 750 ms of each call.

FIGURE 2-50 PPCPS RADIO CONFIGURATION OPTIONS TAB



CONFIGURING THE TRK-240 – DATA ON PRIMARY, VOICE/DATA ON SECONDARY

Use the TRK-240 Programming Software from CES Wireless Technologies to select the settings for data on the TRK-240 mobile data terminal.

SETTING UP THE RADIO TAB

On the **Radio** tab, set the following key areas as shown in Figure 2-51.

- In the Radio Interface area:
 - **Baud Rate** list: select **1200**.
 - **Radio Type** list: select **LTR** for PassPort radios.
 - **Lead in Delay**: type the time as shown from clear-to-send to start of data.
- In the Busy area:
 - **Frame Transmit Function** list: select **Before and After Channel Change**.
 - **Holdoff Time** box: type the time as shown, which means that the radio waits this long after a busy clears before keying.
 - **Busy must be active to receive frames** check box: select this to only decode data when the talkgroup is active.
- In the Frame Transmit area:
 - **Ack Wait Time** box: type the time as shown, which means that the radio waits this long for the Acknowledgement before resending data message.
 - **Retry Window**: type the time as shown, which means that the radio waits a random time before resending data but sends data within this window.
 - **Repeat Count** box: type the time as shown, which is the number of attempts to send data message.
 - **Ack Response Time** box: type the time as shown, which is the amount of time to wait after receiving a message and sending an ACK.



NOTE

Changing other parameters may result in impaired system performance.

FIGURE 2-51 RADIO TAB

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I / ID Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Unit ID

System ID: Unit ID:

Group ID's

Group 1: Group 6:
 Group 2: Group 7:
 Group 3: Group 8:
 Group 4: Group 9:
 Group 5: Group 10:

Radio Interface

Baud Rate:

Radio Type:

Lead In Delay: x 10ms

Request Check: x 1ms

Request Window: x 10ms

Grant Check: x 10ms

Grant Window: x 10ms

Encryption

Encrypt 1: Encrypt 2: Encrypt 3:

Busy

☐ Ignore When Sending Acks
☒ Ignore When PTT In Is Active
 Frame Transmit Function:
 Holdoff Time: x 10ms
☒ Busy must be active to receive frames

Frame Transmit

Ack Wait Time: x 10ms Retry Window: x 10ms
 Repeat Count: Ack Response Time: x 10ms

SETTING UP THE CHANNEL CHANGE TAB

On the **Channel Change** tab, set the following key areas as shown in Figure 2-52:

- Channel Change - Before Data is Sent area:
 - **Timer 2:** This is the time given to the radio to change to the primary Talkgroup.
- Channel Change - After Data is Sent area:
 - **Timer 2:** This is the time given to the radio to change back to the Secondary Talkgroup.
 - **Change list:** Select **After ack is received**. Stays on Primary Talkgroup until ACK is received.
- Acknowledgements area:
 - Clear the **Perform channel change** check box. Do not revert to the Primary Talkgroup to send ACK to data received on the secondary talkgroup.



NOTE

Other fields are important as well, but set them according to your system requirements.

FIGURE 2-52 CHANNEL CHANGE

TRK-240s - [TRK-240]

File Device Configure Program Diagnostics Help

Radio Channel Change I/O Serial GPS ANI / Status Key 1,2 Key 3,4 Key 5,6 Key 7,8 Key 9,0 Key *,#

Channel Change - Before Data Is Sent

Activate aux out R

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: Before channel is accessed

Channel Change - After Data Is Sent

Deactivate aux out R

Timer 1: 0 x10ms Timer 2: 120 x10ms Count: 1

Change: After ack is received

☐ Release PTT After Channel Change for Acks

Acknowledgments

☐ Perform channel change

☒ Decrement retries on channel access error

☐ Enable strip turnoff code on Aux Out 1

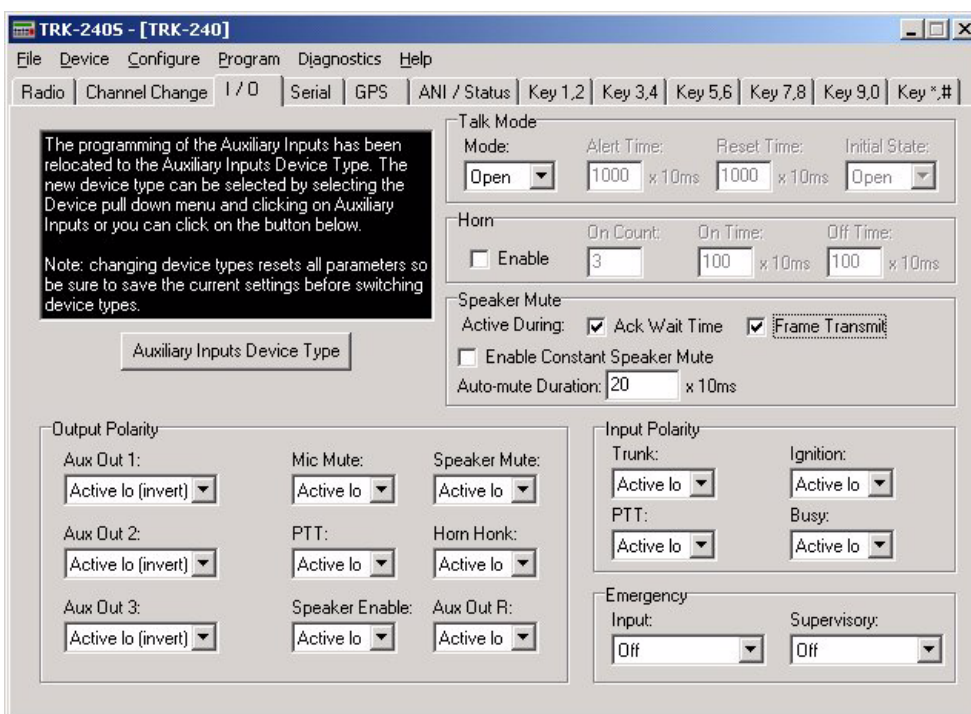
Registration input: Aux in 1: active low

SETTING UP THE I/O TAB

On the **I/O** tab, set the **Speaker Mute** area as shown in Figure 2-53. This mutes the speaker while waiting for the ACK, and when transmitting.

The rest of the screen is user specific, and not related to PassPort operation.

FIGURE 2-53 I/O TAB



SETTING UP THE ANI/STATUS TAB

On the **ANI/Status** tab, set the **PTT Functions**, **Long Term Queue**, and **Short Term Queue** areas as shown in Figure 2-54.

FIGURE 2-54 ANI/STATUS TAB

The screenshot shows the configuration window for the TRK-240S radio, specifically the ANI/Status tab. The window has a menu bar (File, Device, Configure, Program, Diagnostics, Help) and a tab bar with options: Radio, Channel Change, I/O, Serial, GPS, ANI/Status (selected), Key 1,2, Key 3,4, Key 5,6, Key 7,8, Key 9,0, and Key *,#. The main area is divided into several sections:

- ANI:**
 - ☐ Leading ☐ Trailing
 - ☐ Random Random Window Time: 500 x 10ms
- ANI Holdoff:**
 - Count: 0 0 = Off
 - Reset Time: 3000 x 10ms
- PTT Functions:**
 - Double Click: Off (dropdown)
 - TX Limit: 10000 x 10ms
 - Stuck Mic: 12000 x 10ms
 - TX Penalty: 500 x 10ms
 - Guard Time: 300 x 10ms
 - ☒ Disconnect PTT In from PTT Out
- Long Term Queue:**
 - Procedure Time: 5 Minutes
 - Repeat Count: 100
- Short Term Queue:**
 - Ack Wait Time: 500 x 10ms
 - Repeat Count: 4
 - Retry Window: 500 x 10ms
- Remote Key Masking:**
 - ☐ Enable
- Display / Audio Functions:**
 - Backlight: On With Activity (dropdown)
 - Alert Type: Buzzer (dropdown)
 - Queue Size: 25 Messages
 - Alert Time: 150 x 10ms
 - ☐ Disable Work Order Ack

PIN DEFINITIONS

Table 2-1 lists the physical interface to CES Wireless Technologies data equipment.

TABLE 2-1 PHYSICAL INTERFACE TO CES WIRELESS TECHNOLOGIES DATA EQUIPMENT

Radio Accessory connector			Modem Radio Interface Connector	
13	Sw B+	-->	1	Switched B+ input
7	Ground	<-->	2	Power Ground
			5	Shield Ground
5	Flat Tx Audio	<--	4	TX Audio Out
11	Flt/Filtered RX Audio	-->	3	Rx Audio In
14	Opt 4 out - Data Available	-->	16	Aux in 1 PassPort only
8	Opt 1 out - CTS	-->	11	Busy Input
4	Opt 2 out - Any TG detect	-->	10	Aux in R
3	Data PTT Input	<--	13	PTT Output
12	RX Audio Mute	<--	14	Speaker Mute
6	Opt 1 in - Data Revert	<--	8	Aux out R Channel change

USER QUESTIONNAIRE

MOBILE DATA SURVEY GUIDELINES

The following information is essential to understand the customer business and application. Complete only the applicable items; however, the more information supplied, the better the Engineering Group and application Partners can assess the application and provide the solutions required.

1. GENERAL INFORMATION

Name: _____

Contact Name: _____

Address: _____

City/State/ Zip Code: _____

Telephone Number: _____

Fax Number: _____

Email Address: _____

Current Radio User Yes No

Number of voice transmissions per hour per car? ____

Current Data User Yes No

Do you use one common radio for voice and data in the vehicle? Yes No

Number of voice transmissions per hour per car? ____

Number of data transmissions per hour per car? ____

2. OBJECTIVES FOR IMPLEMENTING SYSTEM:

3. INFRASTRUCTURE INFORMATION

Is your existing system: Conventional Trunked CDPD GSM Satellite

If trunked, type of trunking: LTR® Privacy Plus PassPort® Other

If other, please comment: _____

If not trunked, are you planning to switch to a trunked system in the future? Yes No

Number of available channels? _____

Frequency Band _____

Is the system approved for Data Yes No

Indicate the type: Private Community

Is the Base Station Continuous Duty Full Duplex? Yes No

What is the method of Base Station Control?

Local DC Tone Tone DC Remote Control Station E & M (Microwave)

What is the distance from the Dispatch Office to the Base Station? _____ miles

Please check the type of connection between the dispatch office and the base station tower:

Leased Line Dial Up Line Microwave Other

Rate your current radio coverage: Excellent Good Fair Poor

Comments: _____

For Non-Trunked Radio Channels Only:

What is the operation of this channel? Simplex Half Duplex Full Duplex

Please check any of the following that are present: Notch Filters Pass Filter

Sub-Audible tones (DCS or CTCSS) Multicoupler Duplexer Other

Comments: _____

4. RADIO TYPES

Model Name and Number of Units: CDM Series ____ GTX Series ____ M1225 Series ____

Current Fleet Size: _____ units

Estimated Fleet Size: _____ units [future expansion]

5. GEOGRAPHIC COVERAGE & MAPS

If city, municipality or other small geographic region is required, please specify exactly the coverage area.

If larger areas such as states, provinces, or continental coverage are required, please specify.

MAPS:

CES Wireless supplied maps? Yes No

Customer supplied maps? Yes No

Please indicate to what resolution is the mapping software expected to display:

Note that as the resolution is increased or the map area is enlarged so are the requirements for the computer on which the program will reside.

Major cities and highways: _____

Major city roads: _____

City Roads: _____

City Roads, addresses and side streets: _____

Please indicate with an X or other indication of the geographical area that makes up the customer service area. Include plant locations, central dispatch location, remote sites or any other information or items that you believe will be helpful in understanding the system layout.

COVERAGE DIAGRAM

Geographic coverage requirements for:

Implementation: _____

Timetable: _____

What is the target date for the following:

Purchasing the System? _____

Installing the System? _____

Comments regarding the timetable? _____

6. DETAILED REQUIREMENTS

Dispatch System

Single Dispatcher Yes No

If Multiple Dispatcher Workstations, how many _____?

If Multiple Workstations, how many? (Windows Network only supported) _____

Is this an existing Network? Yes No

Where is the Dispatch Center to be located? _____

Is there a requirement to link this system to other regional offices or companies? Yes No

If Multiple Workstations, should we quote the Server? Yes No

Is an interface to an enterprise *host** market specific software required? Yes No

Messaging Information to Vehicle

AVL – Automatic Vehicle Location? Yes No

Pre Determined Messages (Canned Messages) from Dispatcher to Vehicle? Yes No

Status Messages? Yes No

Free Form Text from Dispatcher to Vehicle? Yes No

Form Information Job Ticketing* to Vehicle? Yes No

Average Number of Messages expected to send to vehicle per day? _____

Size of Messages? _____

Number of location reports required per vehicle, per hour per day? _____

Messaging Information from Vehicle

Pre Determined Messages (Canned Messages) from Vehicle to Dispatcher? Yes No

Status Messages? Yes No

Free Form Text from Vehicle to Dispatcher? Yes No

Form Information from Vehicle? Yes No

Average Number of Messages expected from vehicle per day? _____

Size of Messages? _____

Status Messages:

Please indicate the types of status messages that would be required: _____

Forms:

If Form information is required to be sent to or from the vehicle, please provide a sample of the forms and/or as much detail as possible as to the form content and composition.

GPS:

GPS – Global Positioning System Yes No

Polling interval from vehicles to the base station in minutes _____

Will the end user leave the radio coverage area Yes No

If yes, how often? _____

Vehicle Sensors

Is Status or telemetry information required from the vehicle? Yes No

If yes, please indicate the sensor points that require monitoring: _____

List the types of vehicles to be equipped: _____

Approximate age of vehicles: _____

Contact person and number for additional vehicles information: _____

Additional Peripherals: (Yes or No, with explanation if Yes)

Credit Card Reader? Yes No

Credit Card Reader with Credit Card Printer? Yes No

Bar Code Readers? Yes No

Mobile Printers? Yes No

Engine Management Interface? Yes No

Sensors & Controls? Yes No

7. ENTERPRISE SOFTWARE INTERFACE

Customer Existing Software: (Industry Specific batching/dispatching/management software system)

The customer has existing base and software? Yes No

Is the proposed System to interface to this software? Yes No

Is this a central dispatch system? Yes No

Please provide details on existing software and software provider: _____

Do you have someone on staff who is familiar with the software? Yes No

If so, please provide name and contact information:

Software Provider:

Address:

City/State/Zip code:

Telephone Number:

Fax Number:

Contact Name:

Email Address:

DATA AIRTIME USAGE ESTIMATOR

.....

.....

.....

Figure B-1 on page B-2 shows the Data Airtime Usage Estimator. CES Wireless Technologies developed this Excel tool to help you calculate total system airtime usage. Use to help you decide which of the three basic configurations are appropriate to balance voice and data needs. You can download the tool from MOL.

FIGURE B-1 DATA AIRTIME USAGE ESTIMATOR

February 18, 2004

Msg Component Process Time (mSec)	
Lead In Delay	500
Ch Request Time	450
ACK Response Time	500
Channel Drop Time	600

mSec of Data Audio per packet type
150 Acknowledgement
325 Position Only
220 Status Only
380 Status w/ Position
1712 Text estimate (Varies with message length)

Total Process Time by Packet Type		
Blind position	1875	mSec
Ack'd position	3575	mSec
Status Only	3470	mSec
Status w/ Position	3630	mSec
Text	4962	mSec

User Application Details (Day = 8 Hours)	
50 Data Units in Fleet	
5 Minute GPS Interval	12 Positions/Hr/Unit
35 Status Messages/Vehicle/Day	4.375 Statuses/Hr/Unit
9 Text Messages/Vehicle/Day	1.125 Text Msgs/Hr/Unit
160 Characters, Average Text Msg Size	

HOURLY USAGE PROFILE		Seconds	Hours
Position Reports:	<input type="radio"/> Blind <input checked="" type="radio"/> Ack'd	2145.00	0.60
Status Packets:	<input type="radio"/> Status <input checked="" type="radio"/> Status + Pos	794.06	0.22
Text Packets:		279.11	0.08
Total Data Airtime Per Hour			0.89

8 HOUR SHIFT PROFILE		Hours
Total Data Airtime in 8 Hr shift	Data	7.15
Available Voice Airtime per 8Hr shift	Voice	0.85

Pie Chart Legend:
■ Data
■ Voice

PROFILE CATEGORY

Low Level Usage = 2 Hrs or less data airtime/ 8 Hr Shift	Voice & Data Share Channel
Moderate Usage = 2-4 Hrs or less data airtime/ 8 Hr Shift	Voice / Data Steering
Moderate Usage = 2-4 Hrs or less data airtime/ 8 Hr Shift for use with GPS only systems (All mobile initiated data except "polls")	Voice / Data Steering on Mobile, Base Polling on voice
High Level Usage = More than 4 Hrs data airtime/ 8 Hr shift	Suggest Dedicated Data Radio